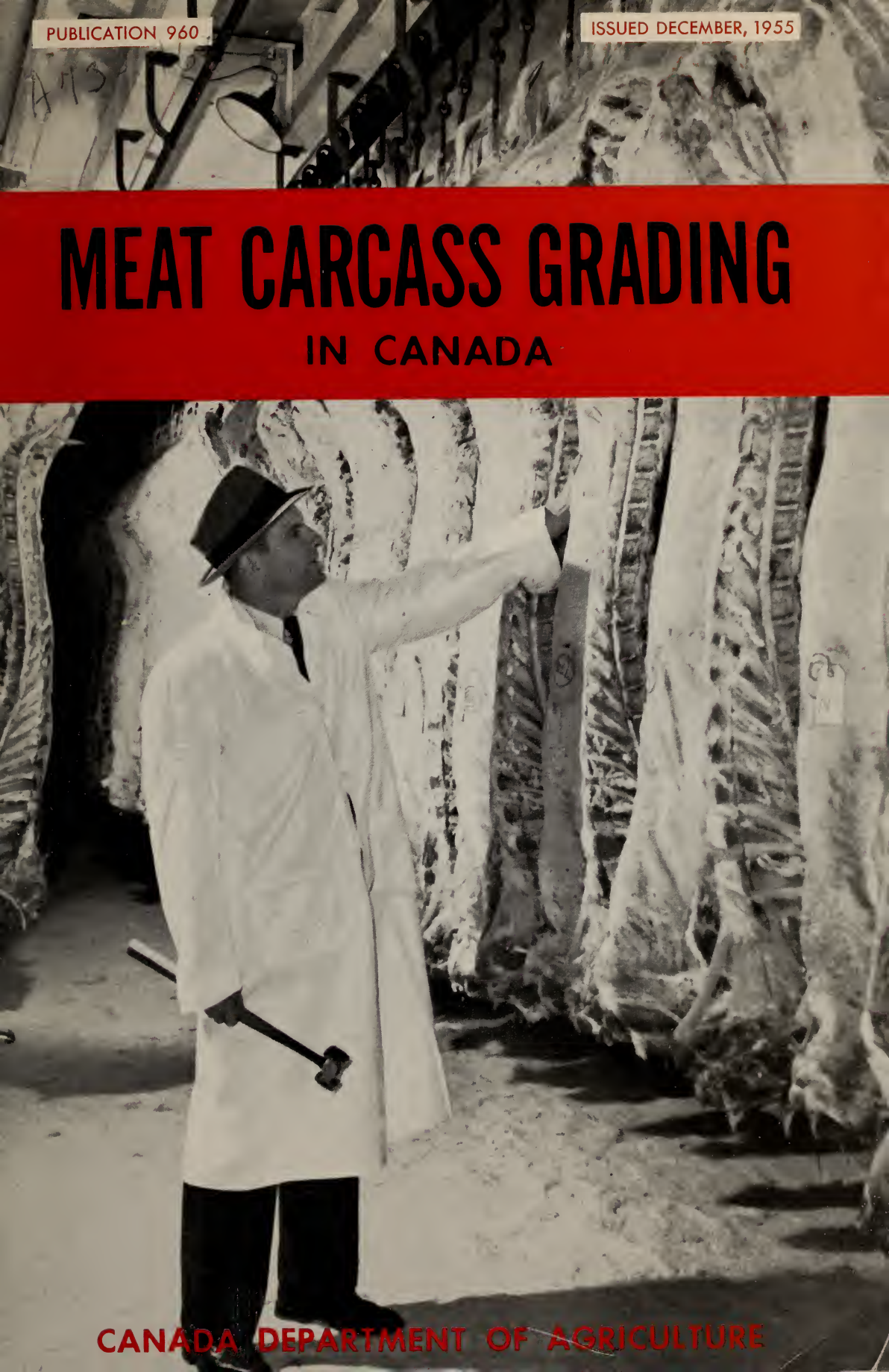
PUBLICATION 960

ISSUED DECEMBER, 1955

MEAT CARCASS GRADING

IN CANADA



CANADA DEPARTMENT OF AGRICULTURE

Digitized by the Internet Archive
in 2013

http://archive.org/details/meatcarcassgradi960mayb

Publication 960 Issued December, 1955

MEAT CARCASS GRADING

IN CANADA

H. J. MAYBEE
Livestock Division
Marketing Service

CANADA DEPARTMENT OF AGRICULTURE

Price 25 cents
2M—20587—12:55

CONTENTS

	Page
Introduction—	
Recognition of quality	5
Government grading	6
Development of a Grading System—	
Establishing grades	6
Legal jurisdiction	7
Grading vs. inspection	7
Uniform grade standards	7
Training of grading staff	8
Complaints and appeals	8
Hog Grading—	
Grading of live hogs	9
Hog carcass grading	12
Operation of a hog carcass grading system	14
Hog carcass grades	28
Condemnation insurance	29
Status of hog carcass grading	29
Grading of pork cuts	31
Chronology of hog grading development	32
Beef and Veal Grading—	
Origin and early development	37
Other beef grading systems	39
National beef grades	40
Factors and techniques in grading beef	45
Brands and branding	58
Grading as a basis of settlement to the farmer	61
Products of the beef animal	62
Present and prospective status of beef grading	65
Veal grading	67
Lamb and Mutton Grading—	
Early history	71
Carcass identification	71
Determination of age and class of lamb and mutton	71
Determination of sex	77
Conformation and finish	77
Grading procedures	78
Dressing percentages	79
Payment according to carcass weight and grade	80

60926—1½

PREFACE

This is a comprehensive account of the development and operation of meat carcass grading systems in Canada, designed for the use of livestock producers and consumers as well as agricultural students and officials.

Further information may be obtained from the Marketing Service, Department of Agriculture, Ottawa, or from the office of the District Supervisor, Livestock Marketing, at one of the following centers:

Vancouver, B.C.	496 West 40th St., (P.O. Box 128).
Edmonton, Alta.	409 Post Office Bldg.
Saskatoon, Sask.	Union Stockyards.
Winnipeg, Man	630 Dominion Public Bldg.
Toronto, Ont.	33 St. Clair Ave. E., Toronto 7.
Montreal, Que.	316 Bridge St., Montreal 22.
Moncton, N.B.	436 Post Office Bldg. (P O. Box 310).

MEAT CARCASS GRADING IN CANADA

H. J. Maybee[1]
Marketing Service,
Canada Department of Agriculture

INTRODUCTION

Consistent with the development of improved methods in all lines of humna endeavor has been the gradual evolution in the marketing and merchandizing of livestock and meats. Like all evolution, this is still proceeding. Within the memory of people still living it has been common practice for meat animals to be slaughtered on the farm and the carcasses hauled to nearby communities for sale to retail butchers or direct to consumers. Traces of this custom may still be seen on a few farmers' markets in areas of Eastern Canada.

Along with the expansion of railway facilities and the growth of cities, large market centers, with public stockyards and groups of large packing plants have developed, each serving a considerable area, perhaps a whole province. While this brought greatly increased efficiency in the handling of livestock and meats, it also involved many long hauls for both. In more recent years, transportation costs, together with the greater dispersal of both producing and consuming populations, have tended toward decentralisation of markets and packing plants. More surplus supplies are being moved to deficit areas as carcasses and cuts in refrigerated cars and trucks rather than on the hoof.

Recognition of Quality

Concurrent with these developments has been the trend toward increased attention to quality in livestock and meats made necessary by the increasing discrimination of consumers in meat purchases. More and more they insist on leanness and tenderness in all meats, and they want small-sized cuts. The introduction of self-service meat counters in retail stores has further focussed attention on quality, since the purchaser is denied the assistance of the butcher in selecting suitable cuts of meat.

The retailer requires of the packer definite kinds and qualities of meats to suit his customers, and the packer in turn seeks to interpret these requirements to the producer by a system of pricing based on the weight and quality of the live animal or the dressed carcass. The buying of live animals for slaughter is a highly specialized job since the buyer must try to predict both the weight and grade of the carcasses. Unofficial classifications for live animals have been developed; experienced buyers can average fairly well on a week's operations but frequently come wide of the mark on individual animals or farmers' lots.

Thus, both producers and consumers are tending to demand more accurate, uniform methods of designating quality in livestock and meats, and increasing use is being made of the meat-grading services provided by the Canada Department of Agriculture in both fields.

---

[1] Chief, Livestock Division. The author hereby acknowledges valuable assistance from R. K. Bennett and Elgin Senn of the Division.

Government Grading

The Government of Canada has set up grade standards and services for many agricultural products, and while it has legal jurisdiction only over commodities shipped interprovincially or on export, such services are used widely within the provinces, either optionally or with concurrent provincial legislation. The maintenance of grade standards by federal authorities is generally favored since it guarantees uniform grades on a national basis and avoids the confusion that would arise from a multiplicity of provincial standards.

In livestock and meats, the first government grading system in this country was for live hogs, inaugurated in 1922. This was later revised in favor of hog carcass grading, and the services have also been expanded to include beef, veal, lamb and mutton carcasses, as well as Wiltshire bacon sides for export to the United Kingdom.

Carcass grades for meat animals, with the exception of hogs, were designed to be suitable both as a basis of settlement to the producer and as a means of indicating meat quality to the consumer. Owing to the processing which takes place in the case of hogs it has not been feasible to carry the carcass grade through to the retail cuts and products. Purchases of hog carcasses at the wholesale level may of course be based on carcass grade.

Current grading systems have been developed only with considerable assistance and advice from representatives of both the producers and the trade, with respect to the specifications for the grades themselves, as well as procedures concerning their application. Revisions and adjustments are made from time to time and will no doubt continue to be made in the light of further experience and changing commercial requirements.

In the following pages an account is given of the development and operation of meat carcass grading systems now effective in Canada, with illustrations and descriptions of some of the more important grades.

DEVELOPMENT OF A GRADING SYSTEM

Much as official weights and measures establish standards of quantity, grading systems establish standards of quality in commodities and a basis of values between buyer and seller.

"A bushel of wheat" is a recognized measure that can be used in the sale of any wheat, but "a bushel of No. 1 Northern" is a bushel of a specific quality of wheat and has a different value than a bushel of No. 2 or No. 3. Similarly, an animal carcass weighing a stated number of pounds establishes a quantity measure of combined meat, bone and fat but gives little indication of the value as to quality, proportion of meat to bone, or lean meat to fat. This can only be done through setting up standards of quality or grades into which carcasses can be sorted.

Establishing Grades

Under the democratic process it takes time to develop a grading system and have its standards accepted by those interested in the marketing of any commodity. Unless it *is* accepted by a majority of those concerned it is almost impossible to maintain or enforce the standards.

Recognition by the government of the demand for a grading service develops through popular appeal from groups of producers or consumers and represent-

ations directed to government departments concerned with the marketing of the product. When it is recognized, working committees are set up to direct experimental work and methods of procedure. They include representatives of producers, trade, consumers and officials of the government department responsible for the administration of the grading system. A technical committee sets up grade specifications and works out practical details, and an administrative committee determines policy and scope of the proposed Act.

When tentative grades and procedures have been agreed upon, a period of testing is usually allowed to discover weaknesses and make necessary changes. Eventually, legislation is passed defining the grades and their specifications and stating how and where they will be applied. A grading staff is trained, necessary certificates and report forms prepared and the service made available to the public.

At the outset, use of the grading system is at the option of buyer and seller but experience has shown that once the standards of quality established under the system are known and appreciated there is widespread demand for its general adoption and enforcement.

Introduction of a grading system for a product is much easier if other commodities in the same field are already being bought and sold on a graded basis since the experience gained with them simplifies both the practical and educational aspects of the problem.

Legal Jurisdiction

It has been legally established that federal authority for the grading of commodities extends only to those shipped from province to province, or on export to another country. When trading is within a province, provincial authorities have control. Provincial authorities therefore have the power to pass legislation applying federal grades on commodities traded within the province and this has been done in many cases. In others, federal grading services are used optionally on agreement between buyers and sellers.

Grading vs Inspection

Under a grading system, government inspectors may be operating graders who do the actual grading of the product, or they may be inspectors only, inspecting and checking grading by employees of the trade. In the grading of livestock and meats, the inspection system was tried and for the most part discarded in favor of official grading. This was possible because the product was concentrated in a limited number of packing plants before distribution.

Uniform Grade Standards

The work of every grader is checked at frequent intervals. In livestock and meat grading, standards are checked at three levels.

Voluntary collaboration between the graders where two or three men work together in a large plant or small center. This can proceed almost daily as opportunities occur.

District or provincial supervision by the grade specialist for the area, usually on a monthly basis.

National supervision by senior specialists from Ottawa who make cross-country visits several times a year to maintain uniformity in the work of the district grade supervisors.

Close attention is paid to the weekly grading percentages at the various centers and any marked deviation from the established pattern is checked to see if it is justified by actual trends in the quality of the product.

Training of Grading Staff

A highly competent staff is vital to the success of the system. This applies to all ranks from administrative heads to junior graders. The men must be technically proficient, able to explain and discuss their decisions at any time and to inform the trade or producers on the reasons for and proper application of official grade standards.

A new grader starts his training under close supervision which is gradually relaxed to regular routine checking. From the outset he assists in making records and studies the various rules and procedures from the Grader's Manual.

Special training is given in groups and short courses which include studies on wholesale and retail cuts and the skeletal and muscular structures of the meat animals.

Complaints and Appeals

The Department has always been willing to review grading which has been subject to protest. No formal appeal or arbitration machinery has been set up but one or more senior officers may constitute a board to review any complaint. However, the grading supervisor for the district is usually able to settle any dispute of this nature.

HOG GRADING IN CANADA

GRADING OF LIVE HOGS

Reasons for Development

After the first World war, Canada found herself with a surplus of hogs and a dwindling market. Quality again assumed great importance on the United Kingdom market and Canadian pork products were losing ground to European suppliers due to lack of a uniformity in weight, type, and degree of finish. The Canadian hog population contained a high proportion of short, thick, fat, lard-type animals and the lean bacon type was scarce. Hogs were bought and sold on the flat basis, all within a shipment going at the same price except for a variable amount of cursory culling of heavies, roughs, and sows. On the public markets they were stuffed with feed and water before weighing up for sale "to gain back the weight lost in shipment".

Danish bacon was extremely favored throughout the United Kingdom. While Canadian bacon had been shipped to Britain in considerable volume previous to and during the 1914-1918 war period, no comprehensive attempt had been made to send a product uniform as to quality, weight of Wiltshires, amount of fat, type or butchering. As a result, Canadian bacon varied tremendously in weight, percentage of fat, conformation and general appearance. Danish bacon on the other hand was uniform in all these factors. Reports of these differences along with a distinct spread in price between Canadian and Danish bacon on the British market were matters of concern in developing the Canadian hog industry.

A National Swine Conference convened in 1921, resulted in an agreement in the trade for the payment of a premium for "Select Bacon" hogs, and the development of a government grading system. The grading of live hogs began in November, 1922, under the Livestock and Livestock Products Act.

Grading was designed to provide a system whereby the farmer producing better hogs would receive greater returns than the farmer marketing inferior animals. True, carloads formerly were priced according to the average quality on the whole load, but since several farmers usually contributed to a carload, the best price available to a farmer with good hogs was an average value of the carload. This did not provide equitable remuneration to a farmer when quality was considered, nor did it furnish incentive for improvement. Grading was therefore agreed upon as a stimulus for better hogs by creating a system whereby values would be computed strictly according to quality.

Operation of the System

A staff of government inspectors was located at public markets and packing plants to grade or inspect the grading of all hogs arriving at these points. At the outset, packing-house employees did some of the grading of direct receipts, but this was mostly discontinued as enough government graders became available to do the grading. Grading certificates covering all hogs graded were signed and issued by the grading staff.

At first, a system of identification by metal eartags was adopted but the cost and distribution of the tags and special pliers was a handicap and this plan

60926—2

was discarded in favor of marking with scissor clips and roofing tar which proved adequate. Instructions were issued in pamphlet form explaining a standardized system of marking which was generally adopted.

Special equipment for sorting hogs was designed and installed in public stockyards and packing plants. This ranged from a simple sorting gate by which a shipment could be split into two lots, to a more elaborate arrangement where a lot could be divided into five grades in one run. Some outfits included a dial scale, so, in the case of marked shipments, each hog was weighed individually and the weight, grade and identification recorded on a tabulating machine.

The development of grading took place in three stages—

1. Compulsory grading of all hogs at stockyards and abattoirs.
2. Compulsory grading, or identification for grading, at country shipping points.
3. Compulsory purchase and sale according to grade.

From the inception of the grading services, some co-operative shipping agents and drovers identified their hogs for official grading at the destination and the producers received settlement accordingly, but during the first few years the majority of the hogs were still sold on the flat basis. In 1927, revised regulations required the shipper to grade at the local loading point, or at his option to mark the hogs for official grading, with a further provision for compulsory marking if the shipper's live grading was unsatisfactory. This was made effective first in Ontario, later in the other provinces as the educational program progressed and provincial legislation was passed.

Gradually the idea of selling according to grade began to gain acceptance in areas where better quality hogs were produced. Packers would quote on both the flat and the graded basis. At many points one shipper would be operating on the graded basis and his competitor on the flat basis. In some areas where all the hogs were of poor type, and opposition to the grading policy was actively fostered by the shippers, adoption of the new system came slowly.

In 1929, the regulations were strengthened and the grades revised. By this time the general quality had been improved to the point where a considerable proportion of the hogs was better than *Thick Smooths*, but not quite of *Select* standard. Accordingly the old *Thick Smooth* and *Shop Hog* grades were discarded and the top three grades established as *Select Bacon*, *Bacon* and *Butcher*. Following this a system was set up whereby hog grading reports were mailed direct to farmers by local offices of the Department. Where the hogs were marked for farmer identification, each farmer's official grade was reported to him. Where the shipper was grading the hogs himself, the shipper's grading on the farmer's lot was reported along with the shipper's grade on the whole shipment (usually one or two carlots) together with the official grading on the whole shipment. Shippers were required to provide the grader with a statement or manifest showing the identification marks, or his own grading. Many shippers graded in close conformity with the official standards, but a shipper whose grading was consistently out of line was required to mark his hogs for official grading.

During these years the government graders frequently went out to country loading points and conducted grading demonstrations for the benefit of the producers and shippers. Special Bacon Hog Fairs, and Bacon Litter Competitions were conducted, and carlot competitions at the larger shows.

Basic Grade for Pricing

The original schedule of grades consisted of *Selects*, *Thick Smooths*, *Shop Hogs*, *Heavies*, *Lights* and *Cull* grades. In trading, the basic price was applied to the *Thick Smooth* grade, with a 10 percent premium for *Selects*, and various deductions for the lower grades.

For many years after the revision the *Bacon* grade continued to be the basic grade for settlement purposes. At first a straight 10 per cent premium was calculated and paid for the top grade hogs. Later, this was converted to a per-head basis to eliminate clerical work and the weighing of hogs by separate grades. For a short period in 1927, *Selects* were quoted as the basic price, and then, under another agreement, both *Selects* and *Thick Smooths* were quoted, with a differential of 50 cents per hundredweight. On the revision of the grades in 1929, the second grade was again taken as the basic grade and $1 per head adopted as the *Select Bacon* premium.

In January, 1932, revised regulations required that all hogs be bought and sold on the graded basis for each transaction, including purchase by the packer. This was shortly endorsed by enabling regulations in all provinces except Quebec. The grading policy did not gain headway in this province for several years until by concentrated effort it was made effective on the Montreal stockyards. In later years, it has become an instrument contributing to great advances in quality and volume of market hogs in Quebec province, as well as in other parts of the country.

Pen of live market hogs

60926—2½

Improvement in Quality

When grading was inaugurated there were large concentrations of lard-type hogs (Poland Chinas, Chester Whites, Duroc Jerseys) in Canada. These were the predominant breeds in the Prairie Provinces and in southwestern Ontario, and were found to some extent in all other areas, intermingled with the English breeds which had more or less bacon type. The lard-type market hogs, even when marketed at desirable weights, fell mostly into the *Thick Smooth*, or *Butcher* grades.

The following table indicates the quality of hogs during the first year of grading, with subsequent improvement under live grading:

	Percentage Top Grade			
	1923	*1929*	*1934*	*1939*
Alberta	2.3	5.8	12.2	33.2
Saskatchewan	4.1	3.6	15.5	23.5
Manitoba	6.6	10.7	14.4	21.8
Ontario	20.7	27.1	30.5	32.9
Quebec	16.4	10.9	12.5	25.4
Canada	15.3	16.5	19.0	30.2

Shortcomings of Live Grading

While live grading was a logical first step toward hog improvement in that it provided for the sorting of bacon-type hogs from the non-bacons, it gradually became evident that there were important weaknesses in the system, such as:

Weights could not be estimated with sufficient accuracy during the grading operation.

Heavy hogs could be starved and shrunk so they came within the desired live weights but still produced Wiltshires or cuts over the desired weight.

Unequal amount of fill in different shipments of hogs and different lots of hogs in truck loads made the price per pound paid inequitable to producers.

Amount of finish on hogs could not be accurately determined alive.

Identification of hogs in certain cases was done with considerable lack of efficiency with the result that many producers of good hogs did not receive the premium to which they were entitled.

As grading developed and the principle was more widely accepted, interest in the efficiency of grading increased. From time to time the grade standards, or the graders' interpretation of them, were questioned. In all cases a check grade of the carcasses after slaughter was acceptable as a final court of appeal. This led to serious consideration of a carcass grading system.

HOG CARCASS GRADING

Development of the System

Carcass grading of hogs had been set up in European countries most actively competing with Canada on the British bacon market and it was felt that Canada must follow suit to further standardize the quality of her bacon with regard to type, weight and finish.

In 1930-31-32 the volume of Canadian bacon on the British market had dwindled from a high of 240 million pounds in 1919, to a low of approximately

11 million pounds for 1931. About this time the price of hogs dropped as low as $3.50 live weight, mainly because of the surplus of pork on the Canadian markets and the virtual loss of the British market. At the British Empire Conference held in Ottawa in 1932, arrangements were made for a quota of Canadian bacon on the British market up to 280 million pounds per year. It was pointed out by the British that Canadian bacon was not so acceptable to the British trade as Danish bacon because of lack of uniformity of weight, variation in degree of finish, and difference of type. This brought sharply into focus the realization of the position of Canadian bacon, resulting from the quality of Canadian hogs. While Canada had made considerable progress in hog improvement, she was being outstripped by other bacon exporting countries.

From 1930 to 1934 considerable experimental work was done in developing a carcass grading system for hogs. This involved working out a mechanical system as well as a satisfactory method of identification, and setting up tentative grades and price differentials.

Actually this had been preceded by an experimental project at a Toronto plant in the fall of 1928 when the entire kill for a period of two months was carcass graded by an official grader. This resulted in tentative carcass grade standards used from then on in checking live gradings, and other projects such as Litter Competitions.

Advantages of Carcass Grading

The main advantages of carcass grading can be summarized as:

(1) More definite determination of the degree and quality of finish and of belly quality.
(2) Official grading of each farmer's lot of hogs.
(3) Specific and accurate weight limitations within grades.
(4) Elimination of inequalities due to yield where carcass weight settlement is practised.
(5) Since each farmer's lot of hogs is identified, it is possible to:
    (a) Trace the origin of soft and oily carcasses and investigate causes.
    (b) Determine the presence of disease in herds of swine and take steps to eradicate it.
    (c) Determine breeding stock from which ridgling pigs originate and eliminate such strains.
    (d) Trace cause of bruising and reduce the occurrence.
    (e) Determine from carcass grading the sources of good breeding stock.

Problems to be Resolved

The main problems were to provide:

(1) A practical method of identifying each farmer's lot of hogs as carcasses after slaughter.
(2) A practical method of accurate weighing and recording weights of carcasses.
(3) A convenient and suitable system of making settlements.

These difficulties were overcome by:

(1) The use of tattooing equipment, first of the hammer type, later of rotary hog tattoos.
(2) The use of suitable automatic weighing equipment in the larger plants.
(3) The use of a special carcass grading and release certificate.

Progress in Development

In 1940, more than half the hogs in Canada were being bought and sold on a carcass weight and carcass grade basis, which had been optional to this time. The effect of this at the moment was that the producers of better quality hogs were selling on the carcass basis in order to get the most for their hogs while the producers of poorer type, over-fat and poor dressing hogs were still selling on the live basis as this was the method by which they received the most

Rail of hogs in the cooler

for their hogs. The result was that the packing industry was paying full price for top grade hogs without being able to balance this with a low enough price for poor quality hogs. Incidentally it was becoming increasingly difficult to efficiently maintain the double service of live and carcass grading. So live grading was discontinued and carcass grading designated as the only official system, commencing in October, 1940.

OPERATION OF A HOG CARCASS GRADING SYSTEM

The introduction of a hog carcass grading system requires many preparatory steps. Not only must the various groups concerned be acquainted with their part in the plan, but the necessary materials and equipment must be at hand and mechanical changes made in the plants. New procedures in handling the hogs and in related paper work must be set up.

Tattooing equipment must be in the hands of truckers, shippers, sales agencies and at packers' receiving yards. Suitable scale tickets and statements of settlement are required and office systems streamlined to facilitate rapid settlement as soon as the hogs are killed and the tickets reach the office.

Mechanical arrangements and procedures within the abattoirs are important. First, a suitable small receiving pen is necessary at the unloading dock for tattooing individual farmers' lots which arrive unidentified. Weighing live hogs becomes unnecessary and unless the live weight is wanted as a matter of general information this operation may be discontinued. The arrangement of the kill

floor and the location of the scale and the grader's stand must be carefully worked out. The carcass should arrive at the scale still in possession of all parts to be included in the weight specified for grading purposes, i.e., head on, tongue in, leaf lard and kidney in, and so on. There must be adequate space for the scale operator to take the tickets from the scale and attach them to the carcass.

The grader's stand must be situated so that the carcasses pass it, after weighing, on the way to the cooler. It must be of suitable height and well lighted. Somewhere along the line from the scale to the grader, will be a place for the plant employee who records the tattoo identification on the scale ticket. Different arrangements are employed in different plants. Where the rate of kill is fairly slow, the scale man can easily write the tattoo number on each ticket. Where the rate is fast, say 350 per hour and upwards, another person is needed to devote full time to recording identification, usually located immediately before or after the grader's position on the line so the tickets are either handed to the grader or taken from him.

Some preliminary sorting of the tickets according to farmer or shipper is usually possible at the time of grading either by the grader or the helper who is recording tattoo numbers. This is facilitated by trays sectioned into small compartments or by peg boards. In most plants the completed tickets are relayed to the office at frequent intervals during the kill so work on the settlements may proceed. Statements will have been headed up in advance from the manifests sent in before the time of slaughter. Grading staff and livestock office personnel of the sales agency or abattoir usually co-operate in completing the grade certificates. The advantage of keeping the various kill lots intact from the holding pens through to the rail will be apparent in facilitating completion of settlements as the kill progresses. Mixing of lots in the shackling pen or the scalding vat should be avoided.

Grader at work

Experience has shown that a grader can do efficient work up to a speed of 600 hogs per hour if he works in short periods. One hour at a time is enough on a fast rail. Graders can alternate between the office and the grader's stand in the large plants. One automatic scale, however, is not adequate at 600 per hour. At this speed two scales are necessary, taking alternate carcasses.

An ingenious mechanical device was developed in the plants so the carcass being weighed would be temporarily free of influence of the moving finger which pushes it along the rail. As the pulley supporting the carcass enters the scale section of the rail, it rolls on to a sliding shoe which carries it forward by gravity ahead of the moving finger, by a foot or so where it pauses momentarily. At the same time the pulley trips an electric switch which activates the scale. The weight is stamped and the ticket ejected, the finger catches up to the pulley and the carcass moves on away from the scale. The sliding shoe snaps back into position for the next carcass.

The grader rapidly attains speed and efficiency in grading the carcasses as they pass along the moving rail. He must exercise judgement on about two-thirds of the hogs since around one third falls automatically into grade because of weight and sex. A glance at the outside of the carcass indicates whether the type and conformation warrant first, second or third grade. A glance at the thickness and distribution of fat complete the appraisal. Graders have convenient measuring tools at hand to check an occasional carcass for length of side or thickness of back fat. This confirms the grade for the odd "liner" and helps keep the eye in trim.

In some of the smaller plants where a grader is not in constant attendance he may grade the carcasses in a holding room or cooler after the kill is completed. Scale tickets showing weight and identification are left attached to the carcasses until removed by the grader. Under this system the grader will test the scale and make check weights on a few carcasses, allowing for shrink.

Responsibility of the Shipper and the Farmer

For successful operation of the carcass grading system it is obvious that accuracy in identification and recording is essential. The shipper must mark the hogs by tattoo and furnish the grader with a list (manifest) showing farmers' names and addresses, with number of hogs and tattoo mark for each farmer. This is to be in the grader's hands by the time of slaughter.

It is in the farmer's interest to see that his shipper or trucker carries out these requirements carefully and promptly. It is important that—

1. tattooing is done efficiently, with no duplicate marks;
2. tattoos be placed on the correct side of the hog to suit the abattoir involved;
3. farmer's names and addresses be correct;
4. the writing on the manifest is clearly legible;
5. the manifest reaches the plant before the hogs are slaughtered.

Tattoo Identification

Each farmer's lot of hogs should be identified before it is mixed with other hogs at farm or assembly point. Farmers who deliver their own hogs may have them tattooed on arrival at the stockyards or plant. To avoid duplication anywhere in Canada, all tattoo allocations are made and registered in Ottawa and copies of these registrations are kept in the offices of the respective District

Tattoos are placed on that side of the hog suitable to the abattoir involved. Imprint should be about 6 inches from the back bone on the cushion of muscle behind the shoulder. All tattoo allocations are made and registered in Ottawa to prevent duplication anywhere in Canada. Also note "Canada Approved" stamp on shoulder.

Supervisors. *Tattoo ink*—appropriate composition is required so it will remain on the skin and not be absorbed, washed out or faded. Only tested and approved ink should be used.

Common Causes of Indistinct Tattoos

Time can be saved and confusion eliminated if tattoos are kept in a high state of readability. Common causes of trouble are:

1. *Lack of Ink:*—Proper tattoo ink should always be used and the machine brushed with ink after each hog is marked.
2. *Congealed Ink:*—Winter tattooing; frozen or congealed ink will not mark satisfactorily.
3. *Dull Needles:*—New characters should replace dull ones that do not carry sufficient ink for a clear mark.
4. *Broken Characters:*—Needles may become loose or drop out.
5. *Inverted Characters:*—In some machines it is possible to invert the characters. Thus, a 5 may be read for a 2 or a 6 for a 9.
6. *Dropping Outside Characters:*—It is important to have outside stationary characters properly in place.
7. *Hog Not Struck Squarely:*—Outside numbers or letters may register indistinctly or not at all.
8. *Marks Misplaced on Carcass:*—Hogs for tattooing should be confined in a space small enough that the mark may be applied properly. The imprint should be about six inches from the back bone on the cushion of muscle behind the shoulder.
9. *Tattoo Upside Down:*—The operator should always stand behind the hog and keep the handle of the machine parallel with the length of the hog.
10. *Duplicate Tattoos:*—Occasionally a hog is marked before the machine has been changed from the previous lot. This hog should be tattooed

again, with the proper numbers, first striking over the original mark to deface it, then twice more within a few inches of the original mark.

11. *Tattooing Wrong Sides:*—Killing floor routines vary with the plants. The operator should always mark the side advised by his buyer, or in case of doubt he might tattoo both sides.

Detention of Carcasses by Grading Inspector

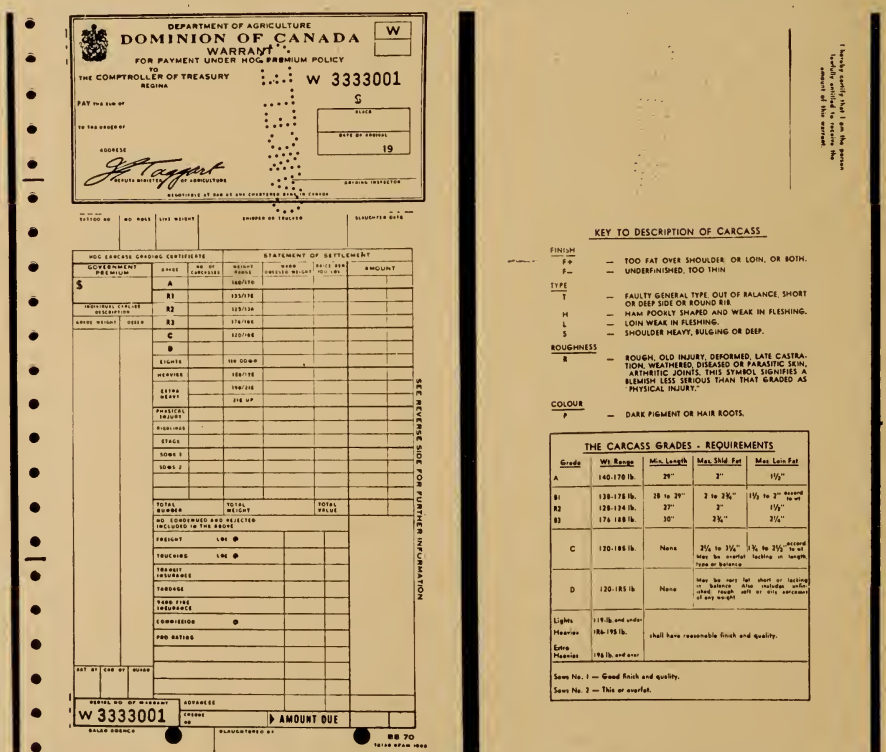
The grader may, if thought necessary, place a "Hold For Grading" tag on any carcass or carcasses. These carcasses must be held by the plant owner or operator until released by the grader. The grader may also withhold issuance of Grading Certificates.

Where it is otherwise impossible to secure co-operation to allow proper allocation of grades by the inspector, he may, after reasonable warning, use this method of securing proper carcass identifications.

Carcass Grading Certificates

The Regulations require the grader to issue grading certificates covering all carcasses graded. These are required to show only the number of carcasses in each grade, farmer's name and address, tattoo identification and relevant information. Originally this was the only type of certificate issued. Packers' or sales agencies' statements of settlement carried the same information as the certificate in addition to weights and the calculation of settlement.

In time a combination of these two documents was evolved. The trade was permitted to provide and use these forms so long as they met departmental requirements with respect to space for grades and grader's signature.


DEPARTMENT OF AGRICULTURE
DOMINION OF CANADA
WARRANT
FOR PAYMENT UNDER HOG PREMIUM POLICY
TO
THE COMPTROLLER OF TREASURY
REGINA
W 3333001
PAY THE SUM OF
$
TO THE ORDER OF
ADDRESS
DATE OF ISSUE
19
GRADING INSPECTOR
RESPONSIBLE AT BAR AT ANY CHARTERED BANK IN CANADA
TATTOO NO.
NO. KILLS
LIVE WEIGHT
SHIPPED OR TRUCKED
SLAUGHTER DATE
HOG CARCASS GRADING CERTIFICATE
STATEMENT OF SETTLEMENT
GOVERNMENT PREMIUM
GRADE
NO. OF CARCASSES
WEIGHT POUNDS
HOOK CARCASS WEIGHT
BASIC PER 100 LBS.
AMOUNT
A
R1
R2
R3
C
D
EIGHTS
HEAVIES
EXTRA HEAVY
PHYSICAL INJURY
RIDGELINGS
STAGS
SOWS 1
SOWS 2
INDIVIDUAL CYCLIST DESCRIPTION
ABOVE WEIGHT
UNDER
TOTAL NUMBER
TOTAL WEIGHT
TOTAL VALUE
NO CONDEMNED AND REJECTED INCLUDED IN THE ABOVE
FREIGHT
LBS
TRUCKING
TRANSIT INSURANCE
TARIFF
BARN FIRE INSURANCE
COMMISSION
PRO RATING
ACT AT END OF HOUR
PERMIT NO. OF WARRANT
W 3333001
ADVANCES
CREDIT NO.
AMOUNT DUE
SALES AGENCY
SLAUGHTERED BY
SEE REVERSE SIDE FOR FURTHER INFORMATION
KEY TO DESCRIPTION OF CARCASS
FINISH
F* — TOO FAT OVER SHOULDER OR LOIN, OR BOTH.
F– — UNDERFINISHED, TOO THIN
TYPE
T — FAULTY GENERAL TYPE, OUT OF BALANCE, SHORT OR DEEP SIDE OR ROUND RIB.
H — HAM POORLY SHAPED AND WEAK IN FLESHING.
L — LOIN WEAK IN FLESHING.
S — SHOULDER HEAVY, BULGING OR DEEP.
ROUGHNESS
R — ROUGH, OLD INJURY, DEFORMED, LATE CASTRATION, WEATHERED, DISEASED OR PARASITIC SKIN, ARTHRITIC JOINTS. THIS SYMBOL SIGNIFIES A BLEMISH LESS SERIOUS THAN THAT GRADED AS PHYSICAL INJURY.
COLOUR
P — DARK PIGMENT OR HAIR ROOTS.
THE CARCASS GRADES - REQUIREMENTS
Grade
Wt. Range
Min. Length
Max. Skid Fat
Max. Loin Fat
A
140-170 lb.
29"
2"
1½"
B1
128-178 lb.
28 to 29"
2 to 2¾"
1½ to 2" measured to wt
B2
128-174 lb.
27"
2"
1½"
B3
176 188 lb.
30"
2¾"
2¼"
C
120-185 lb.
None
2¼ to 3½" 1¾ to 2½" measured to wt
May be overfat lacking in length, type or balance
D
120-185 lb
None
May be very fat short or lacking in balance. Also includes unfinished rough offs or oily carcasses of any weight
Lights
Heavies
Extra Heavies
119 lb. and under
186-195 lb.
196 lb. and over
shall have reasonable finish and quality.
Sows No. 1 — Good finish and quality.
Sows No. 2 — Thin or overfat.

Combination premium warrant, grade certificate and statement of settlement. Face of document at left, reverse side at right.

When the Government Hog Premium Policy was inaugurated in 1944 the trade desired to continue the combination form, and a premium warrant was added. The form presently in use, therefore, is a three-fold document, i.e.—premium warrant, grading certificate and statement of settlement. The Department supplies these forms, and in return the trade makes out the warrants for the Department, which are signed by the grader.

Scale Tickets

Only scale tickets approved by the Department are used for hog carcasses. These are perforated so that a stub showing the weight may be left on the carcass. The larger portion includes spaces for weight, tattoo mark and grade. When completed these are taken to the plant office where the grade certificates are made up.

Grading Symbols

On each scale ticket are listed the symbols the grader uses to indicate his reason for degrading certain carcasses. This applies definitely to B1, C and D carcasses within the A grade weight.

The correct grading symbol for each ticket is important. Many producers study these symbols to improve the quality of their future marketings.

It is generally considered the responsibility of the sales agency or packer to transfer the symbols to the face of the grade certificate along with individual carcass weights, but in any case the record on the tickets on file frequently helps the grader to answer inquiries about the reasons for the grading of particular lots of hogs.

Finish

F+.....Too fat over shoulder, or loin, or both.
F−.....Underfinished, too thin.

Type

T.....Faulty general type, out of balance, short or deep side or round rib.
H.....Ham poorly shaped and weak in fleshing.
L.....Loin weak in fleshing.
S.....Shoulder heavy, bulging or deep.

Roughness

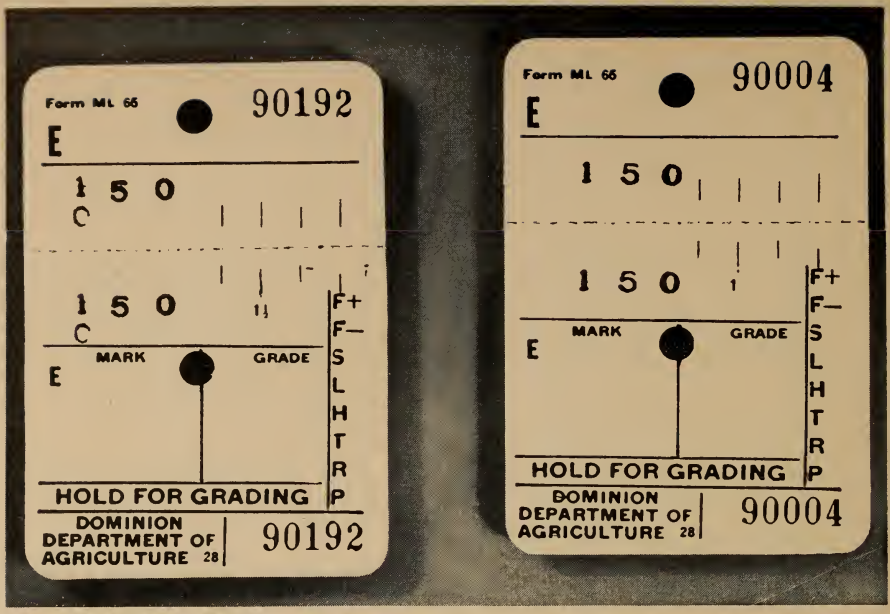
R.....Rough, old injury, deformed, late castration, weathered, diseased or parasitic skin, arthritic joints. This symbol signifies a blemish less serious than that graded as "Physical Injury".

Color

P.....Dark pigment or hair roots.

This list appears on the back of the hog carcass grading certificate for the information of the producer. The individual carcass weights and appropriate symbols are usually entered on the face of the certificate by members of the trade who make up the settlement.

60926—3½



Hog scale tickets

Weighing of Carcasses

All scales used for weighing hog carcasses are subject to the approval of the Minister. There are different kinds of acceptable scales being used:

(1) Printomatic—operate automatically and stamp weights on the tickets.
(2) Printweigh—stamp the scale ticket but manually operated.
(3) Dial — Suitable for smaller plants only. Must be hand operated. The scale operator reads the weight and records it on a scale ticket.
(4) Beam —

Many of the larger packing plants have a second scale to be used if the regular scale goes out of order, or as a check of accuracy of the regular scale. Carcasses are weighed to the nearest pound.

Scale Testing

The grader sees that the checking of scales on which hog carcasses are weighed is carried out. This is done before each kill and if possible during the kill as well. Equipment includes at least four standard 50-pound weights and hooks or a hanging table. Alternative test equipment being used in many plants consists of a weight of about 150 pounds suspended from a pulley which may be run over the scale during the kill where a vacant finger occurs on the moving rail. The advantage of this is that it passes over the scale the same as hog carcasses and therefore checks the operation of the scale in action.

Where a scale is found weighing inaccurately, operations are halted immediately and the scale corrected before further use. Carcasses suspected of having improper weights are re-weighed.

Weights of Pulleys and Gambrels

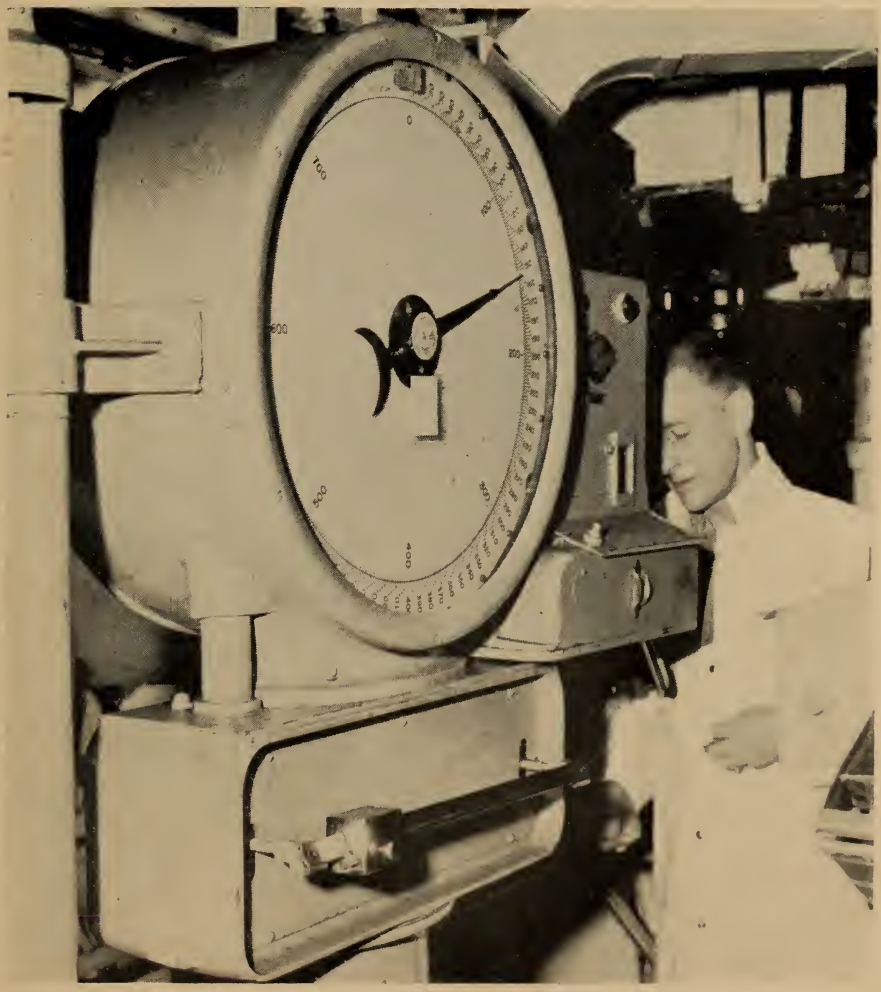
The weights of pulleys and gambrels must be standardized within each plant. Any pulley or gambrel thought to be under weight is marked and weighed

at the first possible opportunity. Very little tolerance is permitted. Weights are made uniform by spotting extra metal on the lighter ones, important when new equipment is about to be used, or a new plant receives grading service.

Average weights of pulleys and gambrels are ascertained at each grading center. The grading inspector and plant representative usually weigh 100 pulleys and gambrels in lots of 25 or 50, record the weight and, from this, estimate the average weight. In a conspicuous place on each scale the grading inspector posts a notice giving particulars as to the tare which must be set to take care of the weight of the pulley and gambrel.

Approval of Weighmen

The regulations state that weighing equipment and weighmen shall be subject to the approval of the Minister. As weighing is a particularly important operation in the system of carcass settlement, the scale operator should always be a person capable of accurately attending a scale. The grader consults with the plant superintendent regarding the suitability of weighmen and forwards recommendations to Ottawa for Departmental approval.



Automatic scale stamps weights on tickets

Grading of Defective Carcasses

Hog carcasses occasionally show various kinds of damage or defect due to disease or injury, and the question arises as to whether the carcass should be degraded. From the outset, ordinary bruising and other minor damage which may have occurred in transit have not been considered factors in grading and any losses due to such thus become part of the packers costs because it is not known who is responsible for the damage. In the case of serious and extensive fresh injury, the grader shows the regular grade and adds "Physical Injury" or "Cripple". Minor defects of farm origin, such as a healed wound, usually result in the carcass being dropped one grade. In case of a serious condition originating on the farm, such as crippling from arthritis, the carcass is graded "Physical Injury" and the terms of settlement are determined between buyer and seller.

Hogs that die before slaughter are not graded but every effort is made to ascertain their identification numbers. The grade certificate will indicate a dead hog in the lot so that the number shipped will be accounted for.

Condemned or rejected carcasses are graded in the usual manner and the number of such carcasses is shown in a space provided on the grade certificate. Settlement for condemned hogs is a matter for agreement between buyer and seller.

Ridgling pigs (carcasses having an internal testicle) receive special attention. Arrangements are made in each plant so that either the grader or the veterinary inspector sees the carcass with the organ still attached, otherwise no carcass is graded "ridgling". Producers have this assurance: even though they believe normal castration took place at the customary time, any carcass graded as a "ridgling" had at least one testicle at time of slaughter. About one per cent of all male pigs marketed are ridglings.

Ridgling carcasses are stamped with a large letter "R" several times on each side. If there is any sexual odor the carcass is condemned by the veterinary inspector as unfit for human food, otherwise they receive special attention by the packer. In some cases cooking tests are conducted, and some may be used for sausage or other ground meat products.

Sow carcasses are graded as such when the mammary development is sufficient to require extra trimming. The commercial value of the carcass is the criterion. Usually a female which has suckled a litter will go into the sow grade, while a "piggy" or pregnant sow, carrying her first litter, and having a tight smooth underline, might get by as a straight pig, say as heavy or extra heavy, according to weight. The trim on a sow's belly does not come off until after the carcass is weighed.

Stags are determined by the obvious indications of masculinity and coarseness, special attention being paid to the size of the pizzle-eye, and the shoulder "shields".

Boars may occasionally be marketed entire. These are graded as such and are subject to condemnation by the veterinary inspector.

Dark hair-roots and pigment are factors in grading. Some carcasses from colored hogs can be cleaned so that no objectionable color remains but in many cases this is impossible and skinning is necessary. Top grade carcasses must be free of "marked evidence of dark hair-roots or pigment". Seedy bellies are also often found in conjunction with this condition: a speckled appearance in the belly cut which necessitates excessive trimming.

Weight Ranges for Grades and Classes

These are based on the commercial usefulness of the cuts from carcasses of various weights, and provide definite limitations on carcass weights for the top grades. While it may seem hardly fair for the producer to receive a discount on a carcass one pound outside the preferred weight range, the fact is the weight ranges are made fairly broad in the producer's favor. Whereas the carcass weights most favored in the trade are around 150-155 pounds, the top price is paid on otherwise eligible carcasses weighing anywhere in a 30-pound range. Thus a hog officially out only "one pound" is actually several pounds removed from the most desirable weight. This principle of a fairly broad range for top grade is generally agreed to be fair and just, gives the breaks to the producer on borderline weights and avoids a greater number of sub-grades for settlement calculations.

As the grades progress downward through the lower qualities the weight limitations are broadened still further.

Determination of Price Differentials between Grades

As indicated there has always been a fairly rigid price spread between the two top grades, either on a per head or per pound basis. This has been maintained by agreement rather than regulation, with representatives of producers and packers conferring from time to time, usually with representatives of the Canada Department of Agriculture in an advisory capacity. This fixed differential between first and second grades has been necessary to guarantee the producer a margin on his top grade.

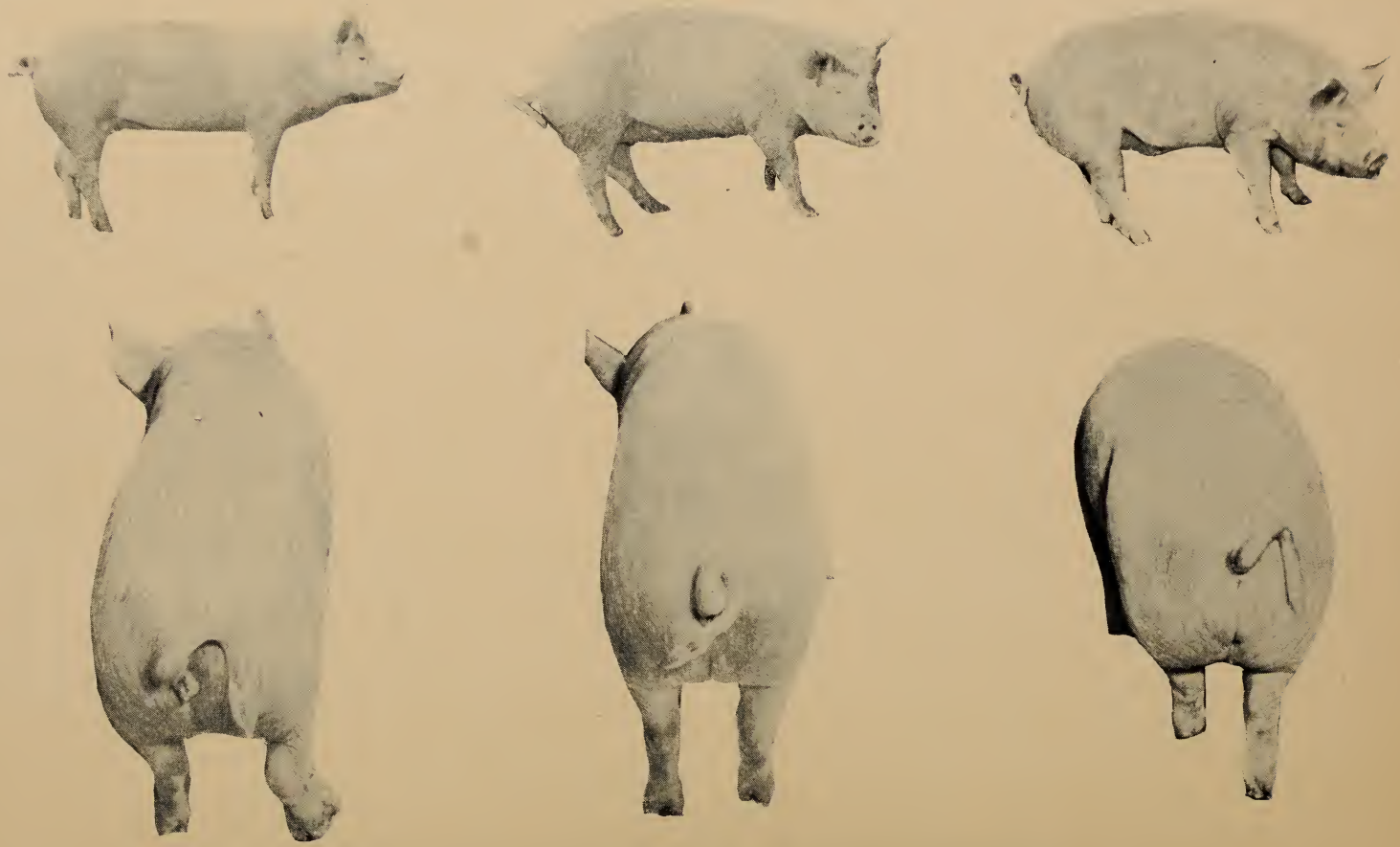
The lower grades find their own level of value according to supply and demand for various weights and qualities. While there is not, as a rule, much fluctuation in these differentials, they do vary according to time and place, and occasional adjustments are useful in checking an oversupply of undesirable kinds, such as lights or heavies.

While all price spreads between grades must be based on commercial values, they may on occasion justifiably depart from these to some extent to provide sufficient incentive for the producer to modify his production methods. They cannot be allowed to depart too far from actual commercial value however, or bargains in certain grades will be created of which some sections of the trade will be quick to take advantage.

The total volume of hogs on the market on any given day is worth a certain sum in the meat trade, determined by what the consumer is willing to pay, and their over-all value will not of course be changed by any process of grading. The grading system merely seeks to distribute this money among the producers in accordance with the quality which they have respectively produced, and properly adjusted price differentials perform an important function in this procedure.

Number of Grades in Schedule

In setting up a schedule of grades for meat carcasses any committee is immediately faced with a problem peculiar to most commodities. The trade tends to require a lot of grades while the producer prefers few grades. All carcasses within a grade do not yield equal weights of the various cuts. This results in many small variations in value which the processor seeks to translate



Left to right: Grade A, B and C live hogs, showing side and end views.

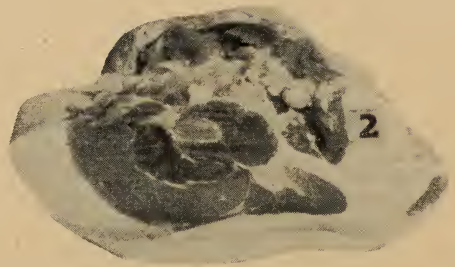
Grade A hog carcasses; inside and side views

Grade B hog carcasses; inside and side views

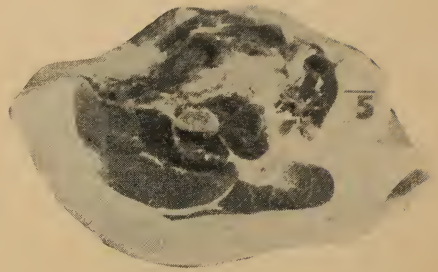
Grade C hog carcasses; inside and side views

60926—4

Grade A ham

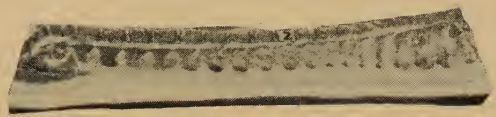


Grade B ham

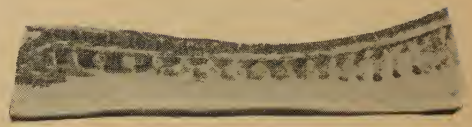


Grade C ham

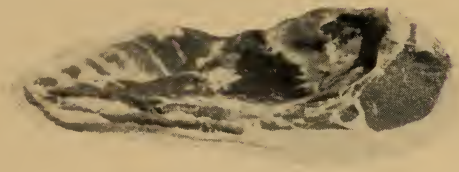
Grade A loin



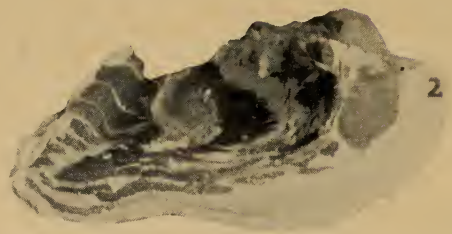
Grade B loin



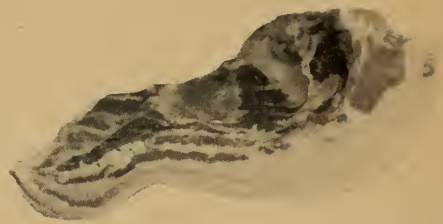
Grade C loin



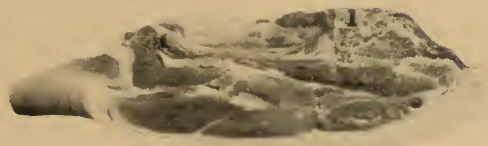
Grade A cross-section



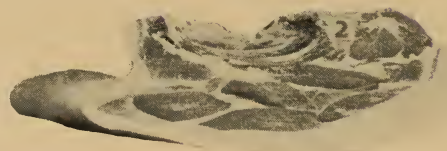
Grade B cross-section



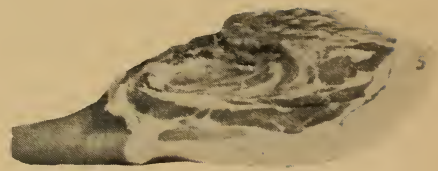
Grade C cross-section



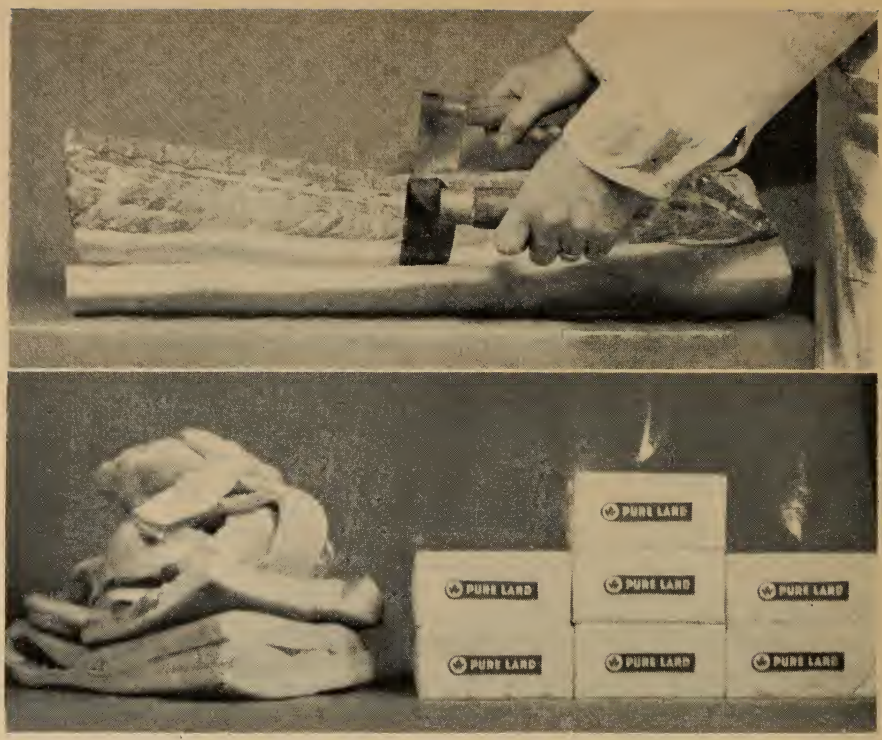
Grade A shoulder



Grade B shoulder



Grade C shoulder



Upper: Trimming fat loin. *Lower:* Pile of fat and resulting lard.

into variations in the purchase price. Thus he likes many grades and many prices. On the other hand, the farmer sees each additional grade as another chance for a discount by the buyer.

Any generally acceptable set of grades must, therefore, seek to come somewhere between these viewpoints. Occasionally two or more grades or subgrades will have similar commercial value, and while they should be reported to the farmer for his information, they can be pooled for settlement calculations. In the case of certain grades the buyer may make a weight division within the grade, with two prices in accordance with the desirability of the different weights.

HOG CARCASS GRADES

There are three main quality grades covering the carcasses in the popular weights, with several lesser grades to accommodate the outweights, culls, sows and stags. The principal specifications of the three main grades, A, B, and C (choice bacon, secondary bacon and non-bacon types) are as follows:

Grade A—Lengthy, lean, smooth and well balanced, light shoulder and jowl, well filled ham and loin, flat side, full flank, firm fat, evenly distributed and not excessive, skin smooth and free from marked evidence of dark hair roots.

This grade provides the best quality of meat as well as cuts of the most popular weights.

Grade B—May be somewhat shorter with more fat than Grade A, rounder in the side, heavier in the shoulder, ham slightly fat or a little thin, back fat uneven or slightly deficient, and fat may be slightly soft.

Grade C—Must be well finished and of good quality, but may be short in the side, round in the rib, heavy in the shoulder, and generally overfat.

Note—The detailed specifications for carcass weights, length of side and fat measurements, subject to occasional adjustment, may be found in the Hog Carcass Grading Regulations.

Yields of Wholesale Cuts

A cutting test conducted in 1950 at Toronto, Winnipeg, and Edmonton showed the following out-turn of trimmed cuts based on warm carcass weights for carcasses in the 151-160-pound range:

	Percentages		
	Grade A	*Grade B*	*Grade C*
Ham	19.87	19.09	17.12
Belly	13.75	14.61	13.83
Loin	16.03	14.73	14.12
New York Shoulder	16.43	15.68	14.66
Total Primal Cuts	66.08	64.11	59.73
Leaf Lard and fat trim	13.58	16.80	22.08

Condemnation Insurance

Standard practice at all plants for many years was to deduct one-half of one percent of the value of all carcasses as insurance against loss by the producer through condemnation. This system was discontinued in September, 1953. Since then, losses through condemnation have become part of the packer's cost of operation except when animals are bought "subject".

Hogs Bought "Subject to Inspection"

Some hogs arrive at point of slaughter in a condition that makes it doubtful if they will pass the veterinary inspection. Then the hog buyer may declare that he will not buy them unless they are subject to inspection. Such hogs should be declared and recorded as bought "subject to inspection" before being slaughtered.

Hog buyers may learn from experience that certain producers market hogs that are badly diseased and likely to be condemned. The buyer in this case notifies the producer or his agent (the trucker, drover or commission firm) that he will only buy these hogs "subject to inspection". In this case the seller stands any loss due to condemnation or rejection.

STATUS OF HOG CARCASS GRADING—PROS AND CONS

There is some feeling among certain producers and their representatives that the government should provide both live hog and carcass grading services to be used at the option of the seller. While not disputing the efficiency of the carcass system, it is believed to cause a loss of bargaining power particularly where hogs are to be shipped to distant markets (Alberta to Vancouver, or to Winnipeg). The proponents of the carcass system do not believe this is necessarily the case, rather that good salesmanship is equally effective under either system. Incidentally the long shipments of live hogs from Western to Eastern Canada have been pretty well discontinued because of increased freight rates.

There is no official requirement, national or provincial, that hogs shall be bought and sold on the basis of carcass weight. The trade has voluntarily

adopted carcass weight as the most equitable basis of settlement between buyer and seller. The fact that the government requires accurate carcass weight for purposes of grading probably encouraged the adoption of carcass weight settlement as it is inconvenient from the accounting standpoint to make settlements on carcass grade and live weights, although it is possible and has been practised to some extent.

Where live hogs are shipped to distant markets for carcass settlement, say several hundred miles, the buyer is usually required to pay some additional price to compensate for any possible flesh shrinkage. Tests have indicated that the carcass yield of hogs, properly handled and loaded, is not greatly affected by long trips by rail, but there may be some small loss, a matter for negotiation between buyer and seller.

The delay in final settlement to the producer caused by carcass grading is not important. Office procedures have been streamlined to permit settlements to go out the same evening or the morning after the kill, and with the present extent of truck transportation a large proportion of the hogs are killed the day they leave the farm. Where hogs undergo a two or three-day trip before slaughter, the delay in settlement is increased to this extent.

Another market channel, although comparatively small, not conducive to the carcass grading system is community auctions. While the majority of the hogs sold through these auctions are feeders or weaners, some market hogs do appear and the tendency is to put them through the ring at so much per pound live weight or, in some cases, so many dollars for the lot. They are usually purchased outright by a drover or dealer who takes them to market and sells them to the packer on carcass grade and weight.

In general, the carcass grading system for hogs has stood the test of time. Following the live grading system, it has given hog quality in Canada a considerable additional boost. It has been charged with diverting hogs from the public markets direct to plants and robbing the producer of the advantage of sale on the open market. But it must be noted that the trend toward direct shipping has been developing concurrently in the United States where there has been no carcass grading. Experience has indicated that the carcass system can function without serious difficulty in any of the regular market channels.

The carcass system has been responsible according to a few critics, for the recent decline in hog quality. They point out that greater gains were made under live grading than since 1940 under exclusive carcass grading, overlooking the fact that much greater gains were possible during the years of live grading. The general quality of Canadian hogs was so low that improvement was comparatively easier to obtain. They also fail to recognize the results achieved in the Maritime Provinces, particularly in P.E.I., the first area to adopt carcass settlement exclusively where almost consistent improvement in hog quality has been taking place ever since. There are other logical reasons of an economic nature for the small decline in hog quality in Central and Western Canada.

The system of hog carcass grading provides the producer with information which he can use to rapidly improve the quality of his market hogs. It assures him of equitable payment for the exact quality and quantity of product he has marketed. It is a barometer which records the degree of success being attained by all the producers, individually and collectively. The grade statement supplied to the farmer indicates, in addition to weight and grade, the reasons why certain

of his carcasses failed to make top grade. From this he can determine whether his breeding stock or his methods of husbandry are at fault. It rests with him as to whether he makes any effort to improve the grade of his next lot of market hogs. There are many producers, some with a large output and some small, who will declare the carcass grading system has enabled them to produce up to 70 or even 90 per cent grade A's and thus considerably increase the profits they derive from hogs.

Farmers have confidence in the carcass weights, believing them much more accurate than the live weights formerly obtained on livestock scales, especially those at local country loading points. Two elements of doubt are removed, first about the accuracy of the scale or the weighman, and secondly about the dressing percentage of the hogs. The time-honored but wasteful practice of filling hogs with feed and water just prior to sale has been eliminated.

It is true that the producer cannot look at his live hog and be sure of the grade but he gets his grade report while the memory of his hog is still fresh in his mind. Some farmers occasionally accompany their hogs to market and see the carcasses graded. Graders and the trade representatives are always glad to arrange and facilitate visits like these. Demonstrations for groups of producers are often conducted where groups of hogs are examined alive, then slaughtered and the carcasses graded and discussed. By these activities farmers become able to recognize desirable conformation and finish in the live hog.

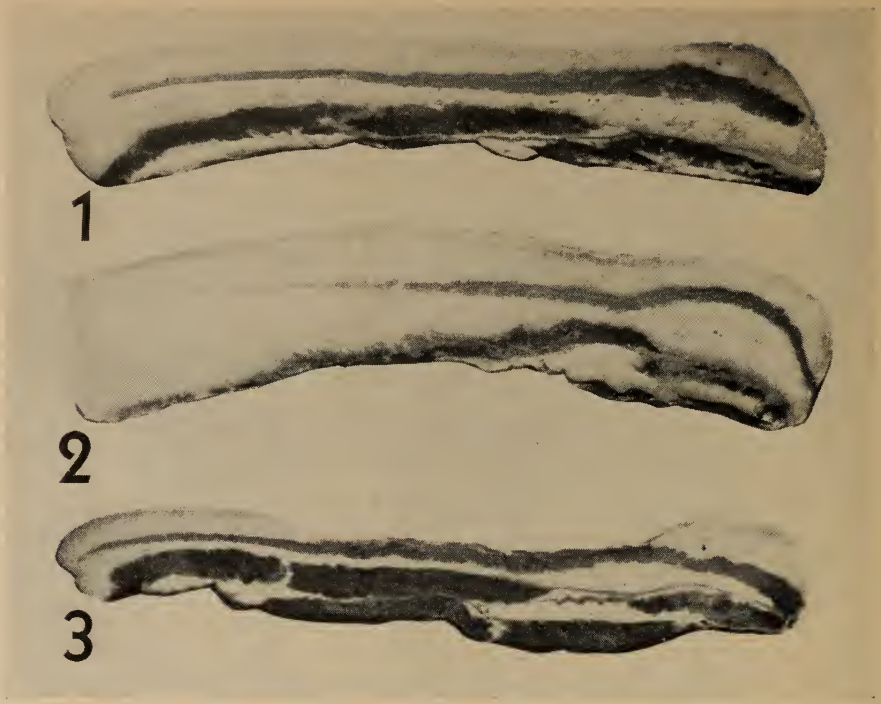
The development and results of the hog grading system in Canada are believed to have been unique; no other country of similar area and diversity has succeeded in standardizing the type and quality of a class of market livestock to a similar extent. Some other countries have however made use of similar plans to meet their needs. Denmark and Holland were carcass-grading hogs for the United Kingdom market before Canada started.

While the system operates for the direct advantage of the producer, the consumer also benefits by having an increased supply of top quality pork products made available to him. The question as to why the carcass grade is not carried through to the consumer will be discussed in the following chapter.

The hog carcass grading system has served as a proving ground for other classes of livestock, and has been of great assistance in designing systems for the settlement to the producer on the carcass grade and weight basis for beef, veal, sheep and lambs. More farmers are turning to this method of sale for all meat animals. It is expected the hog carcass grading system will help bring about considerable further improvement in the quality of Canadian hogs in conformity with consumer requirements in both domestic and export markets.

GRADING OF PORK CUTS

There is some feeling among both producers and consumers that pork cuts should be graded according to government-prescribed standards. While informed producers realize the carcass grade could not, in most cases, be carried through to the trimmed retail cut, they claim with considerable justification that even after trimming the cut from a fat hog contains more seam fat than that from a lean hog. They believe proper recognition of the best quality at the retail counter would increase the returns for the Grade A carcass and widen the spread between it and the lower grades. Consumers find themselves uncertain as to quality when purchasing pork products and seek the assurance of the sort of government grade mark they find on beef.



Sample slices of the type of bacon selected in a consumers' test: (1) First choice; (2) Type liked least; and (3) liked because of its very high percentage of lean and disliked because the general quality demanded in breakfast bacon was lacking. It is not unusual to have several qualities occur in the same side of bacon.

The grading of pork cuts is receiving study and investigation but it poses many problems, mainly in determining the fat and lean content of a piece of meat without cutting into it. Tests have shown the quality of side bacon is related to the quality of the carcass, but not consistently. A second-grade carcass may have a top-grade belly slab, and vice versa. The quality of the belly is not fully determined until it is sliced, but since most bacon is pre-sliced for the retail trade, it conceivably might be possible to establish grade standards for side bacon and have it sorted and packaged accordingly. This would be complicated by the fact that practically every slab would contain two or more grades, and any program of sorting would seriously slow down the process of slicing and wrapping as carried out in most establishments. However, it is possible that continued study and experiment will throw further light on these problems.

CHRONOLOGY OF HOG GRADING DEVELOPMENT

Nov. 22-23, 1921	Conference of Producers, Packers and Agricultural officials at Ottawa. Federal Department requested to set up a hog grading system. Permanent national committee appointed.
Aug. 3 and Sept. 19, 1922	Meetings of the Joint Swine Committee. Proposed regulations reviewed and publicity discussed.
Oct. 6, 1922	Grades established under P.C. 2035.
Oct. 30, 1922	Grading operations commenced.

Export cuts. (a) Wiltshire cut side; (b) Cumberland cut; (c) Export rib back; (d) Fore end; (e) *A.C. ham; (f) Gammon; (g) *A.C. skinned ham.

*Indicates American cut.

March 4, 1924.....Weights for Select Bacon grade revised upwards P.C. 352. 'Feeders" to include all weights.

August, 1926.....Official report—"The National Policy which proposed and urged the production of bacon type hogs and which has been promoted by the swine breeders' associations, Provincial Governments, the Federal Government, and thousands of farmers interested in the production of commercial hogs, has

now reached such vast proportions that the whole swine industry of the Dominion is rapidly progressing towards the complete elimination of the non-bacon breeds and types."

Apr. 22-23, 1927 ..... National Swine Conference, Ottawa. Packers were appealing for relief from the 10 per cent premium. United Kingdom bacon prices were lower than United States equivalent and hogs were being shipped to the United States. Owing to hog improvement there was less than a 10 per cent spread in value between the *Select* and *Thick Smooth* Grades.
The meeting reaffirmed approval of the grading policy and agreed that the spread between the two top grades would be 50 cents per hundredweight, both prices to be quoted.
It was recommended that grade reports be sent to producers and a new grade established for the improved Thick Smooth hog.

Sept. 17, 1927 ..... Effective this date, the packers undertook to make all hog purchases on the graded basis.

March, 1928 ..... P. C. 1787 made effective in Ontario—compulsory grading or marking by shipper, and settlement to farmer according to grade. Shipper required to mark his hogs where his grading not in line with official standards.

Sept. 16, 1929 ..... P.C. 328 became effective—revision of grades to include Select Bacon, Bacon, and Butcher—the provisions requiring settlement on the basis of grade were strengthened, and the shipper required to provide the farmer with a statement of settlement.
Following this, a system was set up for mailing hog grading reports direct to farmers from local offices of the Department of Agriculture.

Feb. 9, 1931 ..... Joint Swine Committee recommended that consideration be given to:
1. The compulsory settlement for all hogs on the basis of official grading.
2. A system for the carcass grading of hogs.

Jan. 1932 ..... P.C. 132 passed. This required the packer as well as the shipper to purchase according to grade, and was adopted by all provinces except Quebec.

March 8, 1934 ..... P.C. 458—provided for the carcass grading of hogs at the option of the buyer and seller.

May 11, 1934 ..... Ministerial Order defined standards for carcass grades.

Jan. 25, 1935 ..... Ministerial Order amended and simplified these carcass standards.

July 27, 1939 ..... P.C. 2064—included standards for carcass grades for the optional carcass grading of hogs.

Sept. 11, 1940 ..... P.C. 4470—established carcass grading as the only official method of grading hogs effective September 30, 1940.

Oct. 26, 1940.....P.C. 6000—rescinded previous regulations.

March 30, 1944.....P.C. 2197—Grades C and D consolidated into one weight class each

Dec. 3, 1947.....P.C. 4933—regulations strengthened from a legal standpoint.

Oct. 18, 1949.....P.C. 5396—identification by "tattoo" required.

Price Differentials and Premiums for Hogs

1922—October.....Hog grading commenced, optional settlement, 10 per cent premium on *Selects* over *Thick Smooths*, the latter being quoted at the basic price.

1925—June.....The 10 per cent premium converted to a per-head basis to eliminate weighing by grade.

1927—March.....Price for *Selects* adopted as the basic price. Shippers required to pay producers on graded basis.

April.....At a National Conference in Ottawa, it was agreed that both *Select* and *Thick Smooth* prices would be quoted, the initial spread to be 50 cents per hundredweight.

1929—September.....The grades revised owing to improvement in hogs, and *Select Bacon*, *Bacon*, and *Butcher* grades adopted. The *Bacon* grade was made the basic grade with $1.00 per head premium for *Select Bacons*.

1934—June.....Carcass grading introduced—optional basis. The same per-head premiums and discounts prevailed for both live and carcass grading.

1940—November.....Live grading discontinued—$1.00 per hog premium continued on "A" Grade carcasses, with B1 as the basic grade.

1944—January.....Government Hog Premiums commenced at $3.00 per hog on "A" Grade and $2.00 per head on "B1" Grade. Packers agreed to pay 40 cents per hundred dressed weight spread between A's and B1's. All per-head premiums and discounts abolished and each grade quoted separately. Grade A price commonly quoted.

1946—April.....Government premiums revised to $2 per hog for Grade A and $1 for Grade B.

1954—April 12.....The A-B1 differential, after considerable negotiation between producer and packer organizations, was increased to $1 per hundredweight, and prices were quoted for both grades.

60926—5½

BEEF AND VEAL GRADING IN CANADA

BEEF GRADING

All beef is good beef and can provide good eating satisfaction if the quality is recognized and the preparation is appropriate to that quality. Some beef costs much more to produce than other beef and will accordingly cost the consumer more. The cattle that come as a by-product of the dairy industry provide cheap meat but it is all equally nourishing, pound for pound, as human food. The grading or marking of beef according to quality provides a standard basis for buying and selling in all transactions from the producer to the consumer and permits each quality to find its proper level according to general acceptability.

Origin and Early Development

There has probably always been some recognition of quality in cattle and beef within the trade but until comparatively recent years this was not carried through to the consumer in any organized manner. The producer, in selling his cattle, finds them classified unofficially as to the probable quality and weight of carcasses they will provide as part of the process of arriving at a price. These classifications may be maintained to some extent by the processor in selling beef to the retailer who may, to some degree, price his beef to the consumer according to quality. Some packing firms have their own systems of grading beef and, by the use of trade names for different grades stamped on the meat, give an indication of quality to the retailer and consumer.

Probably some consumers have been able to obtain satisfactory beef through personal contact with their retail butcher and have complete dependence on this judgment. Until the advent of the government grading however, there was no uniformly general assurance to the consumers as to the quality of beef they were buying.

This was a problem directly affecting the consumers, but the producers were also concerned since there was not sufficient incentive for the finishing of high quality beef and the few who did produce it were not realizing returns commensurate with the additional feed and labor required. So the producers, and organizations working in their behalf were responsible for the original request that a system of beef grading be set up on a national basis.

The active agency in developing the policy was the Joint Beef Committee, which was national in scope and included representatives of the producers, the trade, and federal and provincial departments of agriculture. This group gave intensive study to beef grading during 1927 and 1928, conducting surveys in the retail trade and drafting tentative specifications for the proposed grades. They assumed that if beef of good eating quality was identified by branding, both consumer and producer would benefit.

A national conference in Winnipeg, Manitoba, on June 28 and 29, 1928, considered a report from the Committee and recommended to the Canada Department of Agriculture an official system for grading and branding beef be established. It was shown that the supply of top quality beef was limited

and spread in values between finished and unfinished cattle was too narrow. There was a definite need for more finished cattle weighing 800 pounds to 1,100 pounds alive for the general domestic trade. The best heavy cattle, produced in Western Canada, were being exported to the United States, while those in the East provided heavy cuts for the hotel and restaurant trade. The consumer was not getting the high quality lighter cuts for home use. The department proceeded to set up machinery for the official grading of beef.

The chairman of the Joint Beef Committee in September 1929, stated:

> The beef grading service has been established after a very careful enquiry into the possibility of overcoming some of the anomalies which have existed for a long time in the merchandizing of beef in our domestic market. In all the larger centers of population throughout Canada, and in many of the smaller ones, consumers have in recent years found it increasingly difficult to purchase beef with any assurance that it would prove satisfactory as to eating qualities. At the same time, Canadian cattle producers have received, through our domestic market, only a very limited and uncertain incentive to the production and proper finishing of well-bred cattle. One of the principal causes for this apparent contradictory state of affairs, has been the immense volume of low-grade beef, a by-product of the dairy industry, which has been annually available, and much of which it has been possible to merchandize through dressed beef channels, owing to lack of ability on the part of the average consumer to determine relative quality in beef at the time of purchase.

Outline of the Plan

The new service was inaugurated September 23, 1929. The regulations defined two grades of beef, *Choice* and *Good*, and beef could be graded at the option of the establishment which owned it. There was no requirement that any beef be graded, but if it was graded and branded it had to be done in accordance with the official regulations. An establishment could be a packer, wholesaler, or retailer but in any case only beef killed under federal inspection and carrying the "Canada approved" stamp was eligible for grading and branding. Establishments were permitted to do their own grading and could brand carcasses, sides, or cuts. At the outset there were four Beef Grading Supervisors who acted as travelling inspectors and by frequent visits to the establishments concerned endeavoured to maintain a uniform application of grade standards at all centers.

The branding of the meat for consumer information was the culmination of the whole procedure. The carcasses were branded with continuous ribbon-like marks extending the full length of the side, red ink being used for *Choice* grade and blue ink for *Good*. All brand marks had to be approved and registered by the Department and could include trade names along with the words "*Choice*" or "*Good*". Considerable experimental work was necessary in the development of suitable branding equipment and inks but satisfactory results were achieved.

As success depended on public acceptance and demand for branded beef, extensive publicity included press articles, meetings, pamphlets and other means. An attractive beef chart in color was prepared and distributed and special displays were set up at the larger exhibitions. Retailers were encouraged to feature branded beef and packers to make it available to them.

At first, the volume of beef branded was small and confined to the larger centers of population. The objective was to have all beef eligible for *Red* and

Blue brands immediately branded as such, and then encourage the production of a larger volume of such beef. Steady progress was made as indicated by the following record of beef branded in representative years from 1931 to 1945 inclusive:

	Red Brand	*Blue Brand*	*Total*
	lb.	lb.	lb.
1931	6,346,558	10,894,190	17,240,748
1935	12,869,539	26,893,767	39,763,306
1940	13,203,146	30,530,355	43,733,501
1945	73,867,434	104,185,884	178,053,318

As the work developed, it became evident that uniformity in grading and efficient administration of the policy could be obtained to a high degree only if the official grader graded all the beef to be branded. Every effort was made to train sufficient Livestock Products Graders so that at least one man competent to grade beef would be at each center. Commencing in May, 1942, it was required that all beef to be branded must first be graded and stamped by the official grader, and that all grading must take place at the point of slaughter. Roller branding was also permitted at destination.

OTHER BEEF GRADING SYSTEMS

British Columbia Grading Policy–1938

Late in 1938, the government of British Columbia inaugurated a "Beef Grading Act". Under its terms, all beef sold to consumers within a defined area of Greater Vancouver was required to be officially graded and branded.

The grading was done by federal graders designated as inspectors under the provincial legislation. Advertisements and display cards for beef had to show the grade in lettering as large as the price. A provincial inspector was appointed to do the policing at the retail level, while the federal department undertook to see that regulations were observed with respect to the grading and branding in the plants.

The original British Columbia grades were different from the present National grades (see chart), and at the outset the two top grades were branded with red ink, the third grade with blue ink, and the lower grades with brown ink. In July, 1946, to conform with Wartime Prices and Trade Board regulations, it was necessary to change to red and blue for the two top grades, and brown was used on all the others.

When national grades were being developed, the B. C. Department of Agriculture indicated it would adopt them, and this was done effective July 1, 1948. The national brands were also made mandatory although later it was permitted to show a proprietary mark alongside the national brand mark. The system of compulsory grading of all beef has had the effect of increasing the use of high quality beef in the Vancouver area. An interesting feature of the original schedule of grades was that cow beef had to be designated as such in the brand mark. This was found to create unfair discrimination no matter how good the quality and proved unsatisfactory.

Wartime Policies

In May, 1943, the Wartime Prices and Trade Board designated as "Special" beef for purposes of price control, all carcasses of Red Brand quality having a cold weight of 375 lb. or more and at the same time the department co-operated

by discontinuing the approval for *Red* Brand of any carcass below this weight. The higher price ceiling on "Special" beef had the immediate effect of causing all beef eligible for *Red* Brand to be branded.

A further change at this time was the discontinuance of the grading and branding of wholesale cuts, since the W.P.T.B. regulations did not provide for the grading of cuts. No cut could be sold as "Special" unless it came from a carcass graded "Red Brand". In view of this, the department also discontinued the grading of "Blue Brand" cuts, and only beef in carcass form was graded and stamped for branding.

In July 1946, the W.P.T.B. designated *Blue* Brand beef as a separate grade for purposes of price control, and the minimum weight for *Red* Brand was reduced to 300 pounds (January, 1946) with the approval of the Department. During 1943-4-5, although domestic price ceilings did not distinguish between *Blue* Brand and "Commercial" quality, the popularity of *Blue* Brand beef in Western Canada brought about the branding of nearly all the carcasses of this quality, while in Eastern Canada, owing to the limited supply of "*Blue*" quality, the tendency was to brand very little of it.

Two further wartime developments involving the official grading of beef were the approval and stamping of all beef carcasses supplied to the armed forces in Canada, and the grading of beef to be exported to the United Kingdom by the Meat Board. For the latter purpose, grades for all qualities were established.

NATIONAL BEEF GRADES

The growing multiplicity of grading systems for beef began to be confusing and a single schedule of National grades was deemed highly desirable. Already there were three different sets of specifications for grades covering all qualities of beef: British Columbia grades, Wartime Prices and Trade Board qualities, and Meat Board grades for export, none exactly suitable for general adoption as National Grades.

To initiate the work of drafting a standard set of grades, the Livestock Inspection and Grading Service of the department was instructed in 1945 to bring in a preliminary report and recommendations. A committee of the departmental grading staff prepared a draft schedule of beef grades and it was dealt with by the National Advisory Beef Committee late in the year. Considerable further work was done during 1946 and 1947, and many revisions were made. The original definitions for *Choice* and *Good* beef were used as the basis for the two top grades. Great consideration was given to the grading of cow carcasses. It was agreed at the outset that cow beef should not be marked as such for the consumer's information, as in British Columbia. The National Committee favored as small a number of grades as possible and the first draft included only six. Repeated consultations with the trade, indicated further divisions and the schedule was finally revised to include a total of eight grades and classes.

The objective was to devise a system of grades suitable to indicate quality to the consumer, and useful as the basis of settlement to the producer, if and when the buyer and seller elected to conduct transactions on the carcass basis. There was no intention to make beef grading compulsory in any way but it was thought that in the course of time other provincial governments might follow the example set in British Columbia and establish beef grading in larger centers of population and that the department should be able to offer for adoption a schedule of National Beef Grades. There were many instances where cattle

were being sold by producers on the carcass basis with an improvised settlement arranged on Export or W.P.T.B. grades and it seemed there should be a standard set of grades available for this purpose.

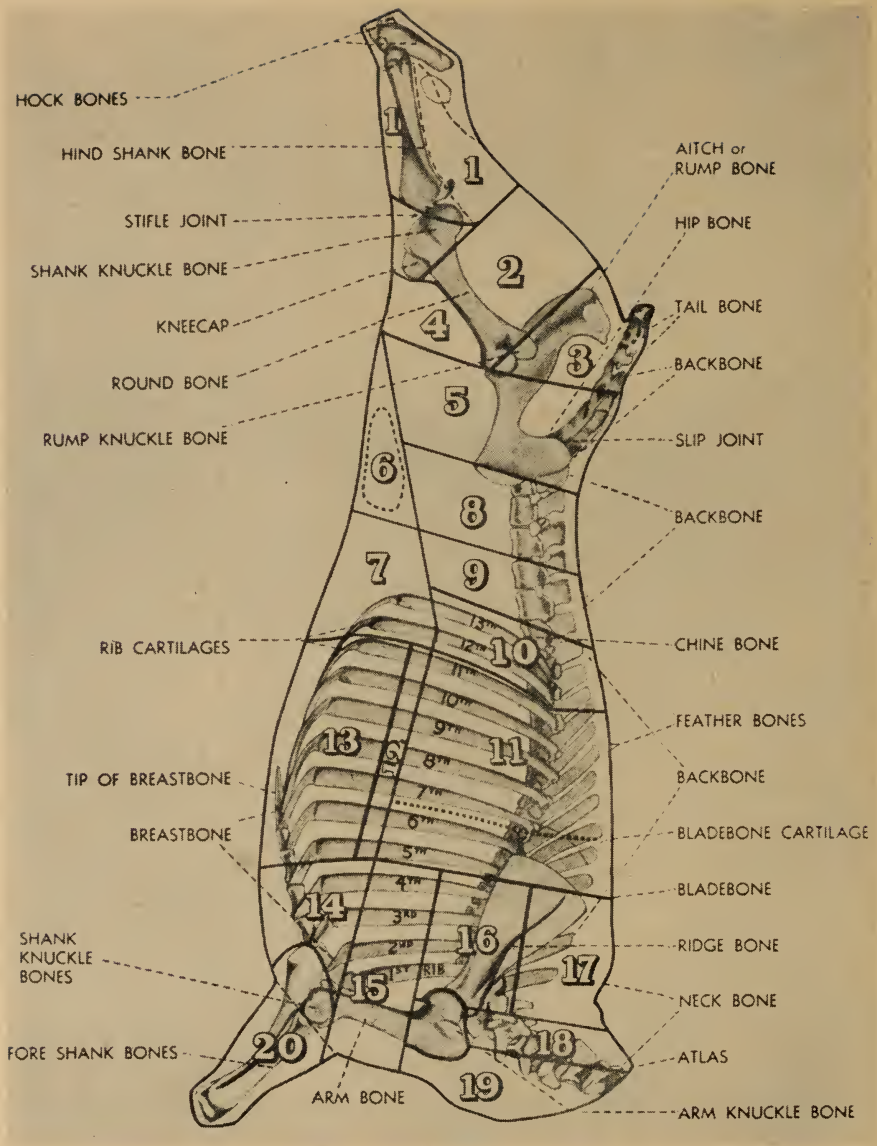
The proposed grades conformed fairly closely to the *Export* grades designed by the Meat Board and the two systems could be synchronized with little adjustment. The B.C. grades could also be fitted into the new grades without difficulty.

The beef grading regulations were revised and incorporated with the specifications for the National grades into a new set of regulations to replace those covering the grading and branding of *Choice* and *Good* beef. On October 1, 1947, the new regulations were established and made effective under Order in Council P.C. 3581, replaced by P.C. 868 issued March 2, 1948.

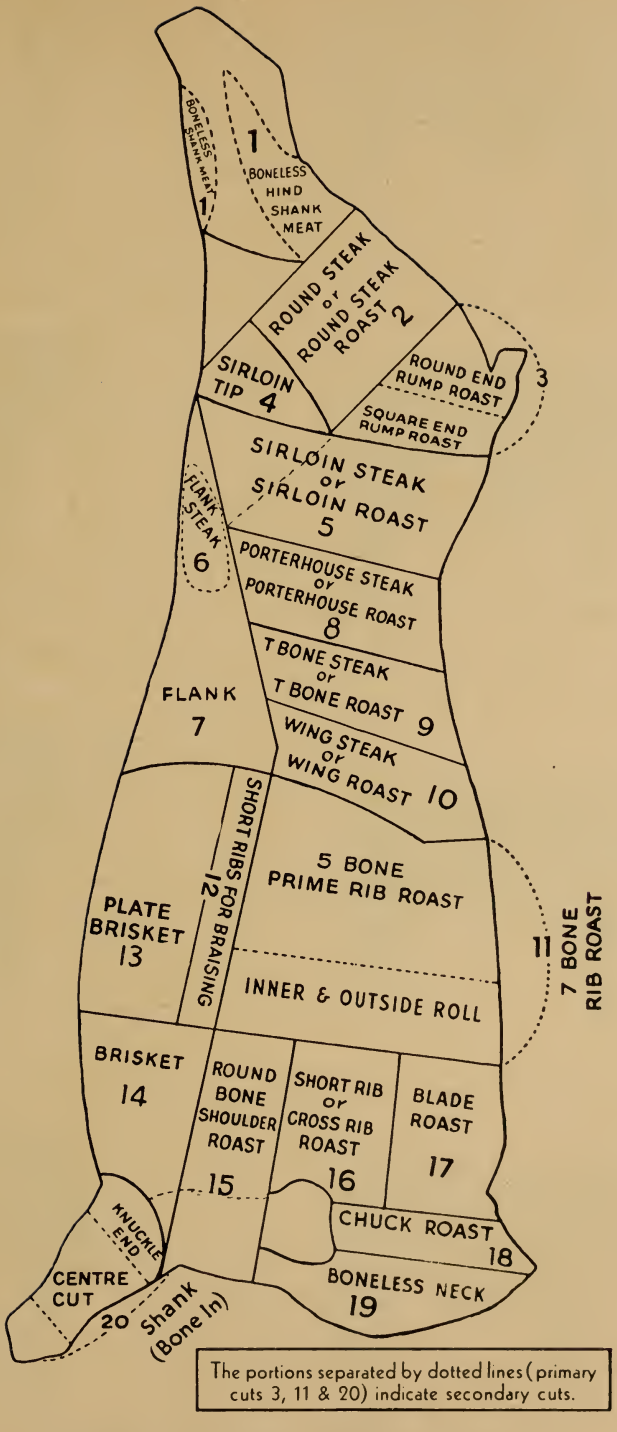
A Ministerial Order was issued August 2, 1949, defining the National Brands to be associated with the National grades.

Comparison of Various Grading Schedules

Market Classes for Live Cattle	B.C. Grades 1938-1948	Meat Board Grades for export 1940-1948	W.P.T.B Grades for Price Control		National Grades 1947
			1943-46	1946	
Choice Steers and Heifers	A1	A	Special	Special	A (Choice)
Good Steers and Heifers	A	B	Commercial	Good	B (Good)
Medium Steers and Heifers	B B Cow	C	Commercial	Commercial	C (Commercial)
Common Steers and Heifers	C D	P (Plain)	Plain	Plain	D1 (Utility)
Good and Top Medium Cows	B Cow C Cow	D	Butcher Cows	Butcher Cows	D2 (Utility)
Low Medium and Common Cows	D Cow	E	Cutter Cows	Cutter Cows	D3 (Utility)
Canners and Cutters	D No Grade	M	Boner Cows and Bulls	Boner Cows and Bulls	M (Man'f'g)
Bulls and Stags	No Grade	M	Boner Cows and Bulls	Boner Cows and Bulls	S



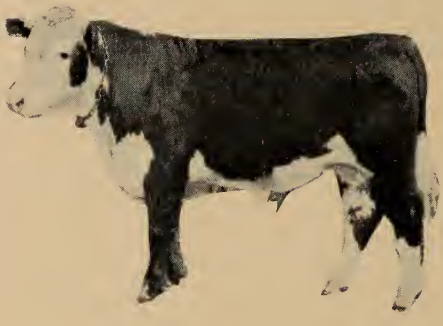
Retailer's standard cutting chart showing location, structure and names of bones.


BONELESS SHANK MEAT 1
1
BONELESS HIND SHANK MEAT
ROUND STEAK or ROUND STEAK ROAST 2
SIRLOIN TIP 4
ROUND END RUMP ROAST
3
SQUARE END RUMP ROAST
SIRLOIN STEAK or SIRLOIN ROAST 5
FLANK STEAK 6
PORTERHOUSE STEAK or PORTERHOUSE ROAST 8
T BONE STEAK or T BONE ROAST 9
FLANK 7
WING STEAK or WING ROAST 10
SHORT RIBS FOR BRAISING 12
5 BONE PRIME RIB ROAST
11
7 BONE RIB ROAST
PLATE BRISKET 13
INNER & OUTSIDE ROLL
BRISKET 14
ROUND BONE SHOULDER ROAST 15
SHORT RIB or CROSS RIB ROAST 16
BLADE ROAST 17
KNUCKLE END
CHUCK ROAST 18
CENTRE CUT
20
Shank (Bone In)
BONELESS NECK 19
The portions separated by dotted lines (primary cuts 3, 11 & 20) indicate secondary cuts.

Standard cutting chart showing retail primary cuts.

Choice Steer

Good Steer



Medium Steer

Common Steer

Grading for the Armed Services

Early in 1941, inspection and stamping of all beef sold on contract to the Department of National Defence for the armed forces in Canada was undertaken by the Department of Agriculture.

Specifications for the quality and weights of beef required were worked out with the assistance of the department and special hand stamps (D.N.D.) for marking the beef were provided. The specifications covered a selection from what was then known as *Commercial* grade.

With the advent of National Beef Grades, the Department of National Defence considered adopting these official grades for their purchases and in February, 1951, the necessary changes in purchasing specifications were completed for beef, along with a variety of other products, to bring this about. The new specifications provided for the purchase of beef according to *National* grade, stamped with the appropriate grade letter in the regular manner, and the use of the "D.N.D." stamp was discontinued. The Department of Defence Production, which does the buying for the armed forces, elected to purchase C grade beef, and later specified C grade steer beef only.

Widening Use of the Service

Since January 1, 1947, all beef slaughtered at inspected plants has been graded in accordance with the National grades by the government grading staff whether or not the owner of the beef wishes it branded. If it is not to be branded, usually no grading stamps are applied. This has provided a record, never previously available, of the carcass quality of all the cattle killed under inspection.

Aside from the impetus to branding provided by W.P.T.B. requirements during World War II, there was a growing acceptance of the system, so with the discontinuance of price control legislation, and from 1950 on, practically all beef eligible for Grades A or B has been graded and branded as such. While some beef of good quality is slaughtered outside inspection, generally speaking where beef in retail outlets does not carry the red or blue ribbon brand it can be assumed to be of C grade quality or lower. At the time of writing a growing interest in the branding of C grade beef was apparent in the trade. Several suppliers in Eastern Canada were commencing to ribbon brand this quality as well as the top grades.

FACTORS AND TECHNIQUES IN GRADING BEEF

Main Factors

The object of grading beef, as any other product, is to classify the carcasses into groups, the groups or grades differing from each other as to general characteristics and quality but having a high degree of uniformity within each group. Thus each grade name or brand mark comes to be recognized in the trade and by consumers as representing a specific kind of beef.

The grade of a beef carcass is mainly determined by these factors:

1. Type or conformation
2. Fleshing
3. Finish
4. Quality

'A' Choice

'A' Choice

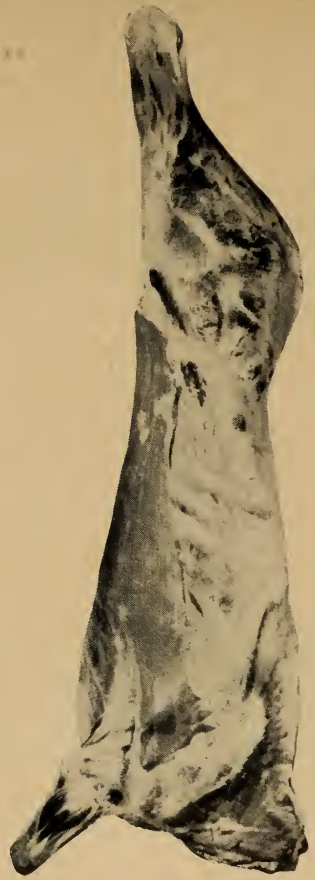
'B' Good

'B' Good

Beef Carcass Grades

'C' Commercial

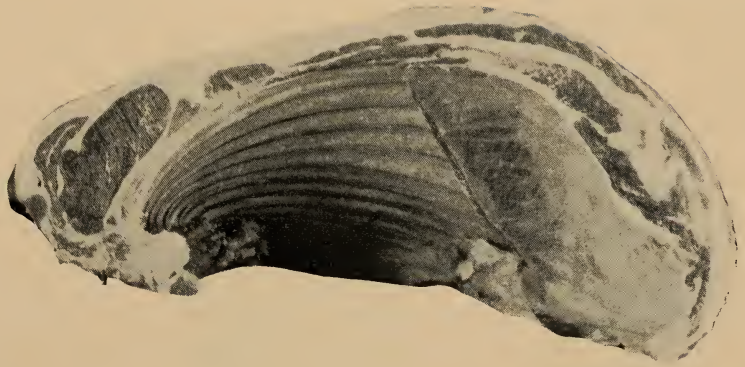
'C' Commercial



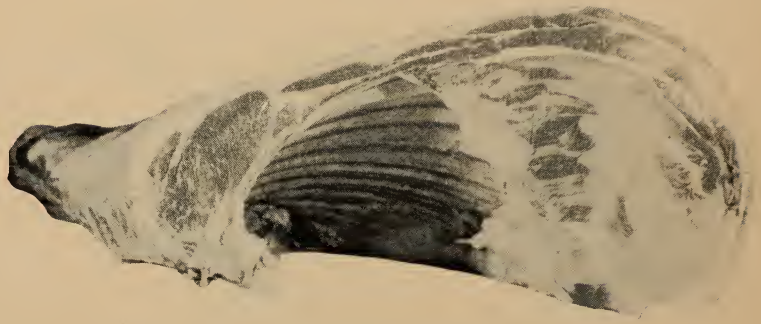
'D1' Utility

'D1' Utility

Beef Carcass Grades

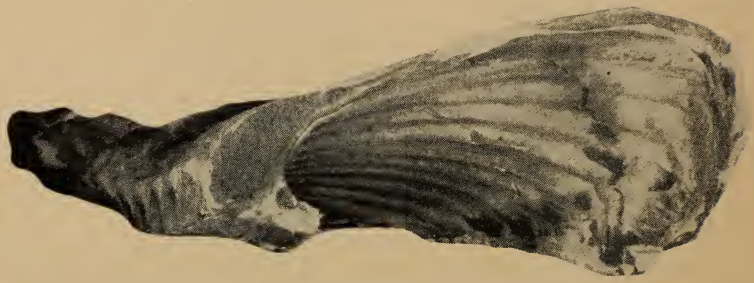


Grade 'A' rib



Grade 'B' rib

Grade 'C' rib



Grade 'D1' rib

Beef Ribs (cross-sections)

Classification of Carcasses

Requirements as to each of these factors vary for any given grade, according to the classification of the animals as to:

1. Sex
2. Weight
3. Age

For purposes of grading, carcasses may be divided into these general classes: (See adjacent Chart on Classes).

Class	*Weight*
1. Heavy steers	Approximately 650 lb. and up
2. Heavy heifers	Approximately 550 lb. and up
3. Butcher steers	Up to 650 lb.
4. Butcher heifers	Up to 550 lb.
5. Fed yearlings	Approximately 300-500 lb.
6. Heifery cows	Any weight
7. Mature cows	Any weight
8. Stags	Any weight
9. Bulls	Any weight

Steers and heifers are characteristically different in conformation. Steers have heavier necks and shoulders, and heavier bone, but excel in the hind quarters, particularly by having better filled loins and rounds. A slight deficiency in the thickness of loin and rounds is characteristic in heifers, which may be somewhat compensated for by lighter bone.

The heavier the carcass the more fat covering or finish is required to provide the desired proportion of fat to lean. Thus while a fairly light brushing of outside fat is satisfactory for a *Red* brand yearling this should become progressively thicker as the weight increases, so that in a heavy steer a comparatively thick coating of fat is required for *Red* brand. With the outside covering a relative degree of interior fat should be associated.

Determination of Age, Sex, and Other Factors

Age.—Age in carcass beef is determined by the condition of the bone. All cattle when slaughtered are split down the back, dividing the vertebrae and exposing the centers of the spinal processes so the bones may be observed.

In young carcasses the split bones of the dorsal vertebrae, to which the 13 ribs are attached, are porous and red in color, having pearl-like cartilages or buttons on their outer tips. These buttons are larger in the chuck, becoming much smaller towards the false or floating ribs.

Following these, in the center of the back are the lumbar vertebrae capped by narrow cartilages on the tip. The change from cartilage to bone is gradual and the intermediate stage appears as a reddish porous condition.

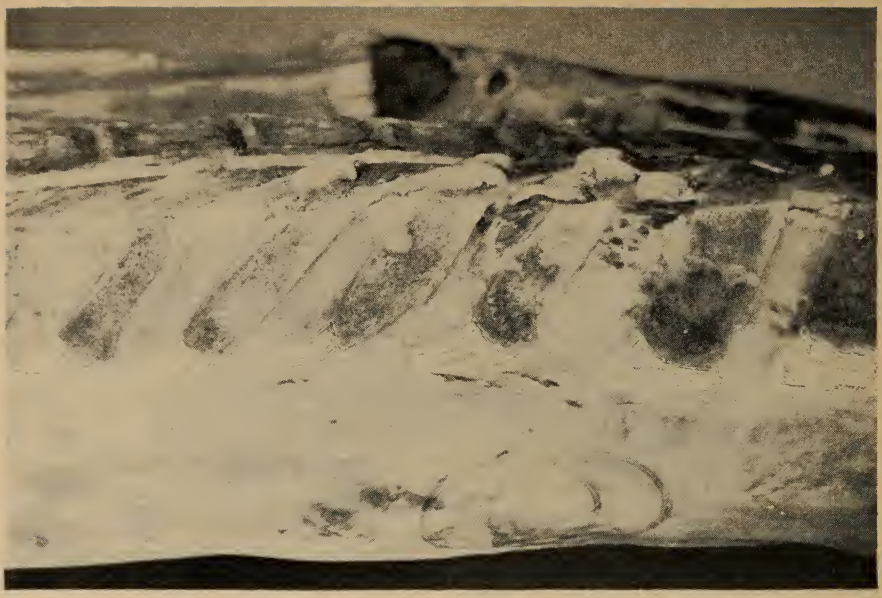
Next is the sacrum section consisting of five joints immediately in front of the tail bones. In young carcasses this section shows distinct openings in the joints with cartilage capping the outer edges. As age advances, these joints close, the cartilage disappears, and in mature carcasses the sacrum is completely closed by ossification becoming one bone.

The aitch bone, part of the pelvic girdle, is the arc-shaped bone exposed on the inside face of the round, covered by pearly cartilage over its entire length

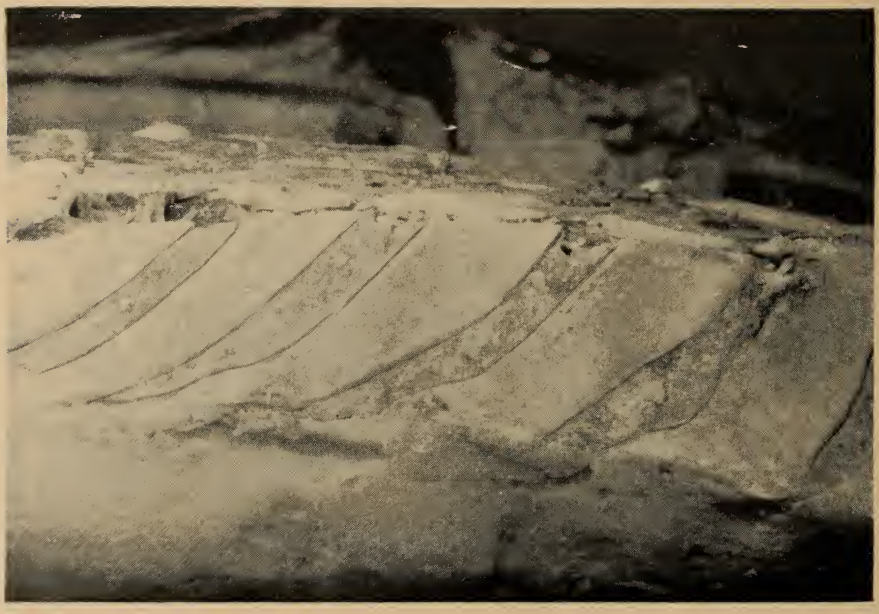
CLASS	SEX	CONFORMATION
Yearling Steer	Cod fat. Erector muscle. Fat curtain above H-bone. Pizzle eye. Heavier forearm	Compact with uniform width. Heavily fleshed in relation to bone.
Yearling Heifer	Lean kidney-shaped area above H-bone. Oval dug, shanks more pointed	Similar to Steer, but usually showing less fleshing in the hind quarter.
Butcher Steer	See Yearling	Grade A—well rounded out with flesh—other grades proportionately less. Deep fleshing over sacrum section is an indication of good fleshing throughout.
Butcher Heifer	See Yearling	Heifers usually have less fullness in hips and loins than steers, finer in the bone, less prominent shoulder points, well filled at neck vein.
Heavy Steer	See Yearling	Similar to butcher steer but may be somewhat rougher due to age.
Heavy Heifer	See Yearling. Dug if present must be firm	Similar to butcher heifer but may be rougher due to age.
Heifery Cow	Same as heifer but dug waxy	As compared with heifer may be more angular, less meat to bone, loin somewhat flat, dished rounds, prominent hook bones.
Cow	Same as heifer with large pelvic cavity and pendulous dug	Angular in shape, prominent hooks, pins, and shoulder points. Lacking meat to bone.
Stag	Masculine appearance. Large erector muscle. Resembles a bull more than a steer. May have a testicle cavity	Slightly cresty at the neck, meatiness throughout hind quarters. May be somewhat coarse in appearance.
Bull	Very large erector muscle and pizzle eye	Heavily muscled over neck, rounds and shanks, with a decided crest.
Spayed Heifer	This class should be graded in accordance with the same standard applied to other beef.	

FINISH	AGE AND WEIGHT
Comparatively light covering acceptable, fat rather transparent. Usually a feathering of waxy fat on the inside of ribs.	Red porous bone in dorsal vertebrae with pearly cartilage on tips or buttons, cartilage on tips of lumbar vertebrae, pinkish red in ribs, sacrum showing 5 divisions, sternum 7.
Inclined to more fat, inside and out, than steers. If highly finished may be slightly patchy.	WEIGHT—300 to approximately 500 lb.
Grade A. Fat covering evenly distributed over carcass, depth depending on weight—Approx. $\frac{1}{2}$″ at point of ribbing. Usually a feathering of fat inside over a portion of the ribs.	Age factors are similar to a yearling steer or heifer with the exception of the dorsal vertebrae which may range from red to grayish in color. WEIGHT
More fat covering than steers of same age. May be patchy at tail and hooks with abundant kidney and inside fat.	Steers up to approx. 650 lb. Heifers up to approx. 550 lb.
May carry more finish than butcher steer, $\frac{1}{2}$″ or more at point of ribbing. Even distribution of fat but may be slightly heavier over last ribs, hooks, and tail head.	Gray color in dorsal vertebrae with usually a red portion adjacent to the button. Red specks or some ossification may appear in the buttons and a slight fusing in the sacrum and sternum sections of the heavier carcasses. WEIGHT
Similar to butcher heifer, but may carry more finish both inside and out. Inclined to patchiness over floating ribs, hooks and tail head.	Steers over 650 lb. Heifers over 550 lb.
More patchiness throughout than heifers, particularly at the tail head.	Cartilage throughout tending towards ossification. Any weight.
May be slaughtered at any stage of finish. Usually rough and patchy when fat.	May have complete ossification, flat white ribs. Any weight.
Tending towards a light covering of fat.	Any age. Any weight.
Most carcasses carry little or no covering, the heavy dark flesh being exposed throughout.	

There should be a noticeable scar on the inside of the flank approximately 6″ from the hook bone on the open side or side with the hanging tender.



Determination of Age.
Youthful animal with pronounced cartilage tips on dorsal vertebrae.



Determination of Age.
Aged animal—cartilage tips are completely ossified (turned to bone).

in yearling carcasses, but in more mature animals, only partially covered. Young animals have a pronounced oval-shaped knob at the lower end of the aitch bone, not present in older females.

Other indications of youth are found in the sternum or breast bone of the brisket. This section is made up of seven distinct joints which, in youth, have the soft pearly cartilage between them but as age advances the joints fuse together leaving but one permanent opening with little or no evidence of pearly cartilage. The sternum bone section of the breast and sacrum section of the loin are the only sections of the bone structure that fuse together as the animals reach adult age.

There are still further indications of youth in the ribs on the inside of the carcass. In carcasses of young animals the ribs are somewhat rounded in shape and show the red blood shading through the shell. This can also be found in the hind shank bones.

As age advances from the yearling to the three-year old stage, the red porous bone shows a gradual hardening from the inside toward the outer edge. The red shading recedes toward the buttons on the tips of the dorsal vertebrae. The carcass of a three-year old animal will show the pearl button at this point becoming spotted with blood specks. Adjacent to the cartilage is the red shading of porous bone and next is the grayish-white bone. This change can also be noted in the bone of the sacrum and sternum sections.

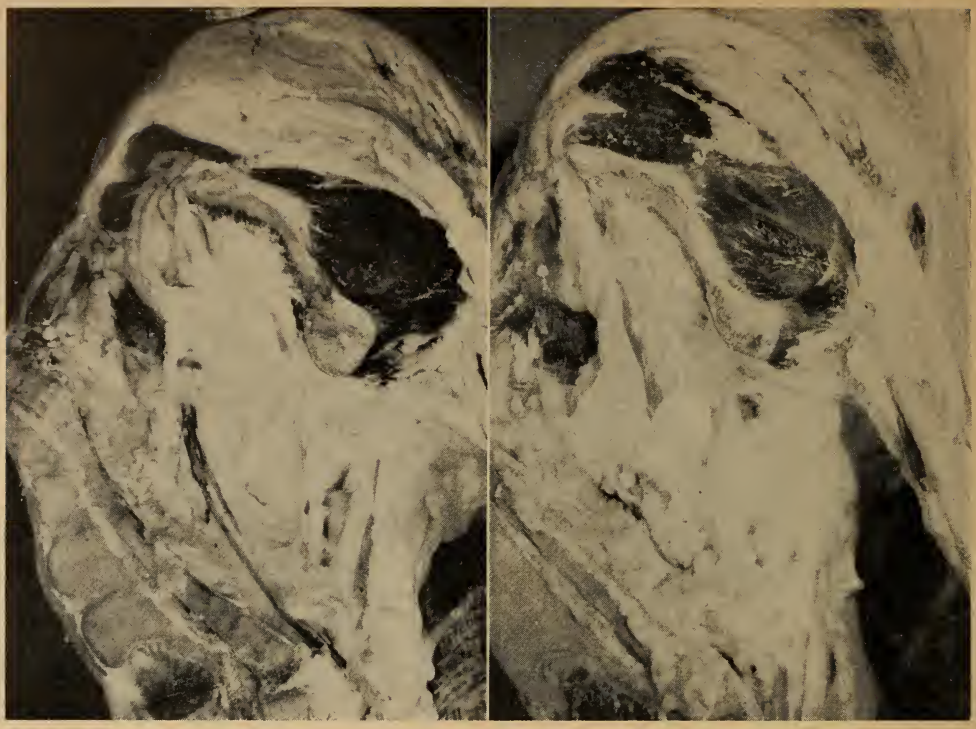
Cattle reach adult age at or about three and one-half years and the cartilage disappears, having become ossified. Some carcasses at this age will show by a thin line of porous bone capping the outer edge of the vertebrae that the cartilage has recently disappeared while in carcasses of older animals the vertebrae are hard, white and flinty throughout with no evidence of youth. The sacrum section is fused into one solid bone. The joints in the breast, or sternum bone, will be fused together with the exception of one permanent opening at the lower end, and all traces of cartilage will have disappeared.

As age advances still further, the knob at the front end of the aitch bone becomes smaller and, in old cow carcasses, completely disappears. This bone widens with age from the center to the back end. The ribs are wide, white, flinty, and flat in old cows and the pelvic cavity is large. The cord of the neck becomes shrivelled and less pliable.

Identification of sex.—Steer carcasses at all ages will show the ruffled or lobulated cod fat at the crotch. Heifers will show a smooth oval dug of solid fat at this point. Heifery cows will have a spongy dug, the amount of sponginess depending upon the advancement in pregnancy at time of slaughter.

Other indications of sex are shown by the area of lean muscle exposed above the aitch bone. In the female this is kidney-shaped and extends the full length of the aitch bone whereas in the steer this area is triangular in shape due to the removal of the pizzle which permits a curtain of fat to conceal the balance of this lean area. The shanks of females, in comparison to those of males, are smaller and less muscular.

In the male carcass the root of the pizzle is cup-shaped and is present immediately at the outer or rear end of the aitch bone, attached to the erector muscle which is the small lean area at this point. In steers this muscle is from one-half to one inch in width, but in bulls it approximates three times the width of that for a steer of the same weight, and the root of the pizzle is larger and coarser.



Determination of Sex.

Left: Male. Irregular lean area and pizzle eye at end of aitch bone.
Right: Female. Large oval-shaped lean area.

Bulls are also distinguished from steers by heavier muscles in the rounds and hind shanks, and a bulging crest over the neck. They also show a greater proportion of lean to fat and an absence of marbling in the cross-sections.

Stags are identified by development resembling that of a bull rather than a steer. Lack of finish usually accompanies stagginess and a testicle cavity may be found in the cod fat.

A problem is presented by staggy steer carcasses. Some of this stagginess has been traced to the improper use of pincers for un-sexing. Other probable causes are the inexperience of the operator, the animal's age when altered, and the use of lamb pincers on large calves.

A desirable conformation in a beef carcass will show full-fleshed rounds on the top or posterior, as well as on the sides of round and edge-wise, viewing from the back of the split sides. The steak piece or sacrum section should be fleshed to where its outside surface is at a right angle to the saw cut. The short-loin along the back should be well furnished with flesh showing a padding along the top or outer edge of the lumbar vertebrae. Also there should be a good span or depth of chine denoting thickness of flesh in proportion to weight of carcass. The rib portion of the side, just below the short loin when hanging, should have the same fullness of flesh as the loin; the wedge end of the blade bone should be well filled. The chuck should show convex fleshing over the blade and humerus bones and fullness in the neck vein below the shoulder point. The shanks should be short and well fleshed.

A poor conformation will show concave fleshing at the various bone angles, the rounds dished on top, falling in at the sides, the sacrum bone section will show the sharp edge of the vertebrae. The hook bone will be prominent. The short loin and rib through the back of the side will show deficiency of fleshing below the edges of the lumbar and dorsal vertebrae. The chuck will show lack of fleshing by the concave appearance over the humerus, blade bone, shoulder point and neck.

Conformation is necessarily one of the main factors in determining the grade of beef as it has to do with the ratio of meat to bone. Good breeding comes first and good feeding second in the production of a good-proportioned, well-fleshed carcass of beef.

Finish.—"Finish" refers to the fat covering on the outside of the carcass, its thickness, smoothness and distribution. The covering on the walls of the inside of a carcass consists of the film or curtain and rolls of interior fat. While this interior fat covering is an indication of good feeding, lack of it does not necessarily debar a carcass from top grade if outward characteristics are good. Some of those carcasses having the heavy film and rolls of fat on the ribs and the protrusion of fat between the split dorsal vertebrae are not good commercial propositions. Many in this condition of finish being marketed other than at show time might find a limited demand. Carcasses, if well bred and fed, will show adequate finish and marbling before they reach the degree of heavy inside fat.

For years leading beef cattle shows have been bringing out some market cattle in such a high state of finish that meat men consider them unsuited for choice beef, and they are sometimes refused by the retail trade.

Best finish is a uniform distribution of fat over the entire carcass on the outside. Surface fat is put on in the form of an "S", from the tail head out over the hookbones and in over the last ribs (at this area is a patch the size of a platter) following the last ribs to top back of blade bone and down over chuck. The last place for finish to be put on is over the outside of the rounds, along the shoulder top and neck. Belly and flank have heavy fat layers in highly finished cattle as noted in cross section of briskets.

The thickness of fat covering desired for any grade depends upon the amount of flesh the carcass carries. Steer carcasses in the heavyweight ranges, if well fleshed, can carry a covering of fat up to $\frac{3}{4}$ inch over the eye of lean and not be overfinished. Carcasses of beef in butcher classes weighing 550 to 650 pounds with around $\frac{1}{2}$ inch of fat covering at the rib cut have sufficient for choice beef, this being ample finish for the consumer who likes fat beef. Many show carcasses carry $\frac{3}{4}$ inch to $1\frac{1}{2}$ inch at this point. As carcass weight decreases the amount of fat covering desired is proportionately less. Fed yearling carcasses are smaller and usually well fleshed and considerably less covering is accepted in this class. It is found on ribbing a carcass of yearling that, due to the translucency of the fat, there is more covering than at first appears.

Color of Fat and Lean.—The color of fat ordinarily ranges from a white in yearlings to a bronze or amber in more mature carcasses. A "yellowish tinge" is acceptable in Grade B, but not the deep lemon yellow frequently found in cow beef. While a yellowish color in beef fat has not been found to cause poor eating quality, it has been so long associated with cow beef that the trade, in many

instances, discriminates against it. The yellow fat is also typical of grass-fed animals of all ages. The yellow color comes from the carotin in the grass or hay and is rich in vitamin A.

Color and texture of lean are usually determined by examining the cross section of the loin muscle after a carcass has been "ribbed down", but some indications may be found in other parts of the carcass. While "dark-cutting beef" has the same eating qualities as that of bright color, it is not so attractive to the consumer and is discounted in the trade. Accordingly, it is not accepted for Grade A when the condition is apparent.

Condition.—Carcasses tend to darken and deteriorate in appearance as they hang in the cooler. although the eating quality is improved. Some allowance is made for this when grading carcasses which have been hanging for a period, although in no case is beef branded if it has begun to spoil. Carcasses with light fat covering deteriorate the fastest.

Bruising and Warbles.—Inspectors of the Health of Animals Division examine all damage and, generally speaking, any bruise passed by them is disregarded in grading. If, however, a bruise appears to be deep enough to materially affect the value of the side, the side may be dropped one or more grades according to the injury.

During late winter and early spring, damage caused by warble fly larvae is considerable. An area of discoloration, presence of an abscess, pus, surrounded by inflamed tissue may be observed along the back of a carcass and if not properly trimmed may affect the appearance considerably. If damage is only slight the grade may be maintained, but if there is considerable discoloration or jelly-like condition present, or considerable mutilation caused by its removal the carcass is lowered one or more grades.

Dugs (Udders).—Females showing any indications of active udder development do not usually show enough youth or quality for Grade A or B, but in any case a carcass having a wet or pendulous dug may not be placed in these grades.

Fed Yearlings.—This class is easily recognized by the light transparent quality of the fat covering, fineness throughout the carcass, and extreme youth. There are no definite weight limitations, but they range from 300 pounds or less up to 500 pounds. For purposes of grading the distinction between beef and veal is made solely on the manner of dressing. Any carcass that has been scribed and shrouded is regarded as beef regardless of its weight.

Stags.—Carcasses showing definite indications of stagginess are placed in grade S. There are, however, carcasses which show signs of stagginess, but with steer characteristics predominating. In these cases it is customary to drop the carcass one grade.

Oxen.—No grade is provided for oxen but such carcasses are graded into the official grade they most nearly resemble and shown on the certificate as "oxen".

Spayed Heifers.—These are occasionally presented for grading, particularly in Western Canada, and are graded in accordance with the same standards applied to other beef. If the bone structure indicates too great an age to qualify for the higher grades the carcass must be placed in the appropriate class in Grade D along with the plain steers and heifers, or cows.

Special Points Observed in Grading

Grading According to the Four Major Cut Areas.—The method of checking grade by cuts has proved of value in properly assessing the overall grade of the carcass, and the following rules are followed as a general guide in grading:—

The grade of three of the four major cut areas, (short hip, long loin, rib and chuck) shall determine the carcass grade provided:

(a) The three best cuts are at least equal to the average of the grade for the carcass and in the case of light weight steers and heifers include the rib and loin.

(b) The inferior cut shall rate at least average for the next lower grade.

In other words a carcass is not necessarily dropped into a lower grade because of a weakness in one section only. The carcass grade will correspond to that for the majority of the cuts.

Age Requirements:—(a) Age requirements are the same for both A and B Grades.

The maximum age for Grades A and B in the heavier females (approximately 550 pounds and up) shall be indicated by slight granulation in the buttons of the upper dorsal vertebrae. In addition, pearl-like cartilage must be evident on the tips of the lumbar vertebrae and there should be indications of cartilage in the sacrum section, and aitch bone, and some red porous condition of the bone. There must be progressively more fleshing as the age increases towards the maximum.

(b) Age requirements for C grade...

There must be at least a pronounced trace of youth on both front and hind quarter evidenced by a red line on the tips of the lumbar vertebrae and some pearl-like cartilage on the dorsal vertebrae, provided that there must be good beef type and conformation to accompany the maximum age. There must be progressively more fleshing as the age increases towards the maximum.

(c) Cow carcasses over age for C grade and having better fleshing than Grade M are graded as follows:

(1) Those with medium to good fleshing are graded D2.

(2) Those below medium fleshing are graded D3.

Over-Fat Carcasses—Over-fat carcasses the owner elects to trim for grading must be ribbed as well as defatted before a decision on the final grade is made. This means that carcasses which would be graded as "C's" because of overfatness must be satisfactorily trimmed of fat and ribbed, either before or after defatting, before they are considered for a higher grade. For settlement to the producer the grade and weight of the untrimmed carcass would normally apply.

Stagginess.—Stagginess indications may not be disregarded in grading and particularly where a carcass is otherwise only a minimum of the grade this factor should be a reason for lowering the grade. The degree of stagginess should be carefully assessed along with the other factors in grading.

Grading Beef Cuts.—While in the earlier years of beef grading some grading and branding of wholesale cuts took place no official specifications have been issued for beef cut grades. In recent years grading has been restricted to carcasses or sides.

There are differences of opinion regarding the value of cut grading to the industry. Unquestionably there are carcasses whose cuts would not all fall

into the same grade if graded after breaking but a thorough check on the incidence of such carcasses has not yet been achieved, although investigations have been made. Frequently a female carcass will have a weak hip or round and be satisfactory in the other cuts. Some carcasses have good finish over the rib or loin or both while the two ends lack finish. Probably further studies will reveal whether the official branding of beef cuts would benefit producers or consumers. Under such a system the practice would be for the owner of the beef to present for carcass grading all carcasses consistently uniform throughout while those of mixed conformation and finish would be withheld for cut grading. This might result in some A grade cuts being obtained from B grade carcasses and some B grade cuts from C grade carcasses. One point is clear cut grading requires more time and manpower in comparison with carcass grading.

The carcass with two grades of cuts is, of course, given recognition under the system of grading previously mentioned, whereby the carcass grade follows the grade of the majority of the cuts. This reduces the number of cuts which appear to be in the wrong grade after breaking.

BRANDS AND BRANDING

An important feature of the beef grading system is branding for consumer recognition of quality. Ribbon-like brand marks are applied throughout the length of the carcass so practically every cut will carry a portion of the mark. (See chart on the application of the brands.)

Brands and Their Registration

The color of the brand mark indicates the grade while the inscription may or may not. Considerable latitude was originally permitted in the content and design of brands used in the trade. Many firms used the firm name or private brand name, either alone or in association with the grade name or letter. It is definitely preferable that the latter be included and all brands currently being registered do include the grade name or letter or both. Marks one to two inches wide are most suitable. Irregularities in the surface of the beef make it difficult to obtain a good impression with a wider roller.

All brands used to indicate national grades must be registered with the Department at Ottawa. This avoids duplication of trade names and serves to keep uniform the types of brands used. The continuous-ribbon type of brand mark on meats is reserved by the federal government for use in connection with national grades. Markings for other purposes must be in some other form.

National Brands

National brand marks are defined by Ministerial Order and may be used at the option of the owner of the beef. These include grade name and grade letter and nothing else. In British Columbia, under provincial legislation, only national brands are required, but proprietary brand marks of a lesser width may be associated with the national mark by attaching it alongside on the roller. This style of brand has been adopted by some operators in other provinces.

Equipment and Inks

Brand marks are applied with roller-type, self-inking instruments made for the purpose. The design and lettering is formed by blunt-nosed needles to carry the ink to the surface of the beef.

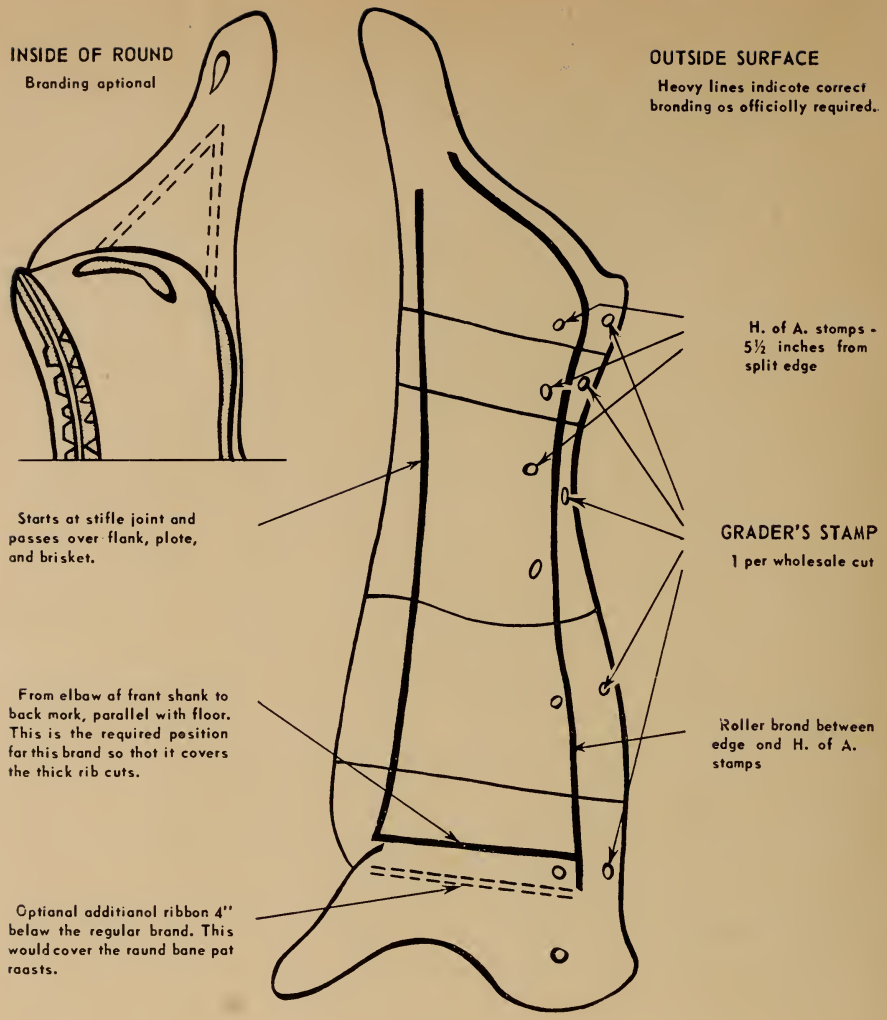
Upper left: Branding roller. *Lower left:* Carcass showing grader's stamp 'A', choice or 'A' brand mark and Canada Approved stamp. *Right:* Good or 'B' brand mark.

Red ink is used for grade A, blue for grade B, and brown for the lower grades. A fourth color will be added when a suitable one is developed. Only inks approved by the Department may be used to ribbon brand beef. Before approval, an ink sample is chemically checked to make sure it is edible, and is subjected to a thorough practical test for desired color, quick-drying and lasting qualities. Ink is usually applied to the felt inking rollers on the branding tool from a small standard oil can. The trade supplies its own ink and equipment for branding.

Each grader carries his personal hammer stamps to apply the grade letters authorizing the ribbon branding. He uses brown ink and places the grade stamp on each wholesale cut on each side of beef—10 stamps per carcass.

Procedure in Grading and Branding

Grading and stamping is always done at point of slaughter. It is preferable that the branding be done there also in the interest of better supervision and control but branding may be deferred until after shipment. This occurs mainly in cases of fairly lengthy shipment between slaughterer and wholesaler where


INSIDE OF ROUND
Branding optional
OUTSIDE SURFACE
Heavy lines indicate correct branding as officially required.
H. of A. stamps - 5½ inches from split edge
Starts at stifle joint and passes over flank, plate, and brisket.
GRADER'S STAMP
1 per wholesale cut
From elbow of front shank to back mark, parallel with floor. This is the required position for this brand so that it covers the thick rib cuts.
Roller brand between edge and H. of A. stamps
Optional additional ribbon 4" below the regular brand. This would cover the round bone pot roasts.

Beef branding and stamping chart. Official graders should see that all branding is standardized in accordance with the brand marks shown in heavy lines above. The marks shown in dotted lines are recommended for complete coverage but are optional to the trade.

the wholesaler does not do his own slaughtering. In some such cases the wholesaler prefers his own brands to the slaughterer's mark. Also the wholesaler may place his own branding equipment in the hands of the distant slaughterer who supplies him, so his beef will carry his own brand when it arrives. There has been objection to ribbon-branding beef previous to a long shipment because of smearing of the brand marks during handling and transit, but this is not a serious difficulty when approved ink is used.

For the most part, if the grader is asked to grade-stamp carcasses it is expected they will be ribbon branded. That is, the department does not propose to grade beef so the grade may be used as a trading factor at the wholesale level unless it is to be branded for consumer benefit at the retail level. Exceptions are cases where no retail purchaser is involved. Many organizations and institutions purchase carcass beef according to government grade, and the graders'

hand stamp indicates the grade. Examples are the Department of Defence Production purchasing for the armed forces; also penitentiaries, hospitals and hotels.

Security of Equipment

Extraordinary precautions are taken to prevent unauthorized use of legitimate branding equipment. It may be borrowed or stolen and used to misbrand beef below quality. The owners of the branding rollers must nominate one responsible employee in each plant to have custody of the equipment, to see that it is properly used, never left lying about even momentarily, and when not in use kept locked in a place especially provided. This does not prevent the making and use of spurious branding equipment but is valuable in protecting the integrity of the official brands. The use of imitation brands is usually discovered and stopped before it reaches important proportions.

GRADING BEEF AS A BASIS OF SETTLEMENT TO THE FARMER

As indicated, beef carcass grading was initiated as a means of branding to facilitate consumer recognition of quality, and thus bring indirect benefit to the producer. There is no doubt this has been effective but there is increasing interest in deriving more direct producer benefit from the grading service by using carcass grades as the basis of sale and purchase between the farmer and the packer. Associated with this is usually the use of dressed weight rather than live weight as the selling weight.

The traditional system of selling beef cattle according to live weight and classification is becoming more and more recognized as fraught with inaccuracies, most of them unavoidable. Tests have shown the considerable margin of error in the prediction of carcass weight and quality by even the most experienced of experts. Average results may be good when taken on a large number of cattle but the tendency is to miss out on the best and the poorest in yield and quality. Thus the producer of the best loses out to some extent in favor of the producer of the poorest. It will be obvious that a situation of this kind lends itself to deliberate as well as unavoidable inaccuracies.

The growing realization of this has caused many producers of good cattle to seek a better basis of settlement to assure them of full returns for the weight and quality of beef produced. This has largely been accomplished through private arrangement with the buyer whereby carcass weight and quality would be factors in arriving at the settlement. These arrangements differ in detail but have the same net result in that returns are based on actual carcass value, and they eliminate the not uncommon anomaly of a high-yielding top-grade carcass being hung on the rail at a lower cost per pound than one of lower quality. Even though the better animal brought more per pound on the hoof, it did not bring as much more as it was worth.

Official Grading for the Producer

In 1951 the Maritime Co-operative Service began the sale of cattle and calves on the basis of dressed weight and official carcass grade, and the numbers handled on this basis have shown a substantial increase each year since (1954). Procedures are similar to those for hogs. Special care is taken to obtain accurate warm-carcass weights. The carcasses may be graded warm immediately after dressing, if desired for speedy settlement, but this is usually done after the shrouds are removed the next morning. The Co-op. confers with the packers and issues a

weekly price list for all grades. A few grades are subdivided, according to weight or quality, for pricing purposes, to come close to the actual commercial value of each kind of carcass.

Farmers in the Maritime Provinces seem pleased with this method of selling cattle as well as calves, lambs and hogs. Each farmer receives a combination statement showing the official carcass grading, weights, prices and calculation of settlement. Groups of producers and their shipping agents frequently visit the packing plants to see carcass grading in progress and learn more of the requirements for a good meat animal.

Requests for beef carcass grading on behalf of the producer are occurring with more frequency at various centers across the country, and graders are being asked to issue grade certificates. This seems to indicate a trend which may develop in time into the principal method of buying and selling meat animals.

PRODUCTS OF THE BEEF ANIMAL

Carcass Yields of Cattle

Carcass yield or dressing percentage (the proportion of the live weight represented by the carcass weight) varies considerably, even within classes and weight ranges. In general, the dressing percentage for cattle falls between 40 and 60 per cent, and a range of 10 per cent is not uncommon among cattle or similar quality.

Many factors come into play, the principal ones being:

Weight of animal—the larger the beast, the higher the yield.

Finish or fatness—yield from the thin animal will be low and from the fat animal high.

Fill—the amount of feed and water in the animal's body at time the live weight is taken is important. Cattle shipped a considerable distance without feed or water will have a high carcass yield when based on the "Weight off Car" weight at destination. Conversely, the yield of the same cattle will be lower if calculated on the "Free on Board" weight at shipping point. Alternatively, the animals might be re-filled with feed and water at the market and then weighed up for sale, in which event the dressing percentage would also be low and somewhat in line with the F.O.B. yield.

Accuracy of weights—errors in calculating yields have occurred because of incorrect live weights, especially those taken on local country scales or farm scales, but this is not frequent.

Defatting—another factor which may appear in connection with beef carcass yields is the complete or partial removal of internal fats at time of dressing. While there is no standard procedure since wartime regulations were rescinded, there is an increasing tendency to remove the fats from the body cavities on the kill floor.

Examples of Yields Obtained in Routine Marketings

The following tables show average yields for cattle of various grades and weight ranges, which were obtained on several markets. Some comparisons between W.O.C. and F.O.B. cattle are included.

The following dressing percentages are for warm carcasses as they leave the kill floor. Cold weights, after cooler shrink, would be around 2 per cent less.

Average Dressing Percentages

Winter and Spring 1952

Class and Grade	No. Cattle	Carcass weights				
		Under 300	300-400	400-500	500-600	600-up
Steers A	986	.....	54·5	56·3	57·7	58·1
B	287	.....	53·6	54·8	55·8	56·2
C	285	58·5	51·6	52·7	53·8	54·7
D1	177	52·2	49·8	51·3	52·1	51·2
Heifers A	222	.....	55·0	56·2	57·4	54·9
B	115	.....	54·3	54·4	54·5	56·4
C	203	50·5	51·8	52·0	53·1	53·4
D1	135	48·6	49·8	50·7	51·1	.....
Cows D2	715	.....	48·5	49·0	51·4	53·1
D3	140	.....	47·3	47·6	49·9	50·7
M	96	44·8	44·1	47·5	48·6	.....
Bulls S	44	47·9	52·2	52·5	51·8	53·7
Total	3,405					

Summer and Fall, 1951

Grade	Class	Cattle	Carcass weights								
			Under 300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000	1000-up
A	Steers W.O.C.	51	.....	55.5	55.2	55.7	58.1	57.0			
	Heifers W.O.C.	8	.....	53.7	58.3	53.7					
B	Steers W.O.C.	84	.....	56.3	54.0	55.6	55.9	55.3			
	Heifers W.O.C.	33	.....	52.9	52.0	52.9	54.1				
C	Steers W.O.C.	64	.....	56.9	54.5	54.6	54.8	56.5			
	F.O.B.	129	.....	51.2	51.9	52.8	54.0	52.4			
	Heifers W.O.C.	59	.....	52.9	52.5	53.4	56.5				
	F.O.B.	70	.....	50.7	51.4	53.5	55.6				
D1	Steers W.O.C.	7	.....	53.2	51.4						
	F.O.B.	70	.....	51.6	50.7	52.9	54.2	.....			
	Heifers W.O.C.	16	46.2	48.0	.....	49.1					
	F.O.B.	13	.....	51.6	52.0	.....					
D2	Cows W.O.C.	72	.....	.....	48.7	51.1	50.1	51.0			
	F.O.B.	17	.....	.....	47.1	50.4	51.7	51.0			
D3	Cows W.O.C.	59	.....	44.5	47.1	47.0	47.6	53.8			
	F.O.B.	18	.....	.....	47.4	47.5	51.4				
M	Boners W.O.C.	92	42.4	43.6	43.4	45.6	43.5				
S	Bulls W.O.C.	49	46.5	49.0	51.1	52.5	55.2	53.8	54.8	56.1	59.7
	Total	911									

NOTE: These data were obtained in the Maritime Provinces, Montreal, Winnipeg, and Edmonton. Most A and B Grades were from Edmonton and Winnipeg, and most lower grades from the Maritimes. All F.O.B. cattle were killed at Charlottetown, P.E.I.

Original records showed whether grass fed or grain fed, and whether fat in or fat out. Throughout these tests most of the carcasses had 80 to 90 per cent of the defatting fat removed. Some of the lower grades had it left in, but there was no consistant difference in yield between "fat in" and "fat out". Neither was there any consistant difference in yield between grass fed and grain fed when compared within the same grade and weight range.

These averages can be only a rough guide as to what may be expected since there is so much variation within each group. A spread of 6 to 8 per cent within one grade and weight range is common, and with cows this may range up to 12 per cent and more. For instance, one lot of 46 boner cows with carcasses in the 300-400 lb. class had individual carcass yields of from 36·3 to 55·6 per cent, W.O.C. basis. Producers who contemplate sale on the dressed weight basis for the first time would be well advised to obtain yield figures on test lots of cattle from their own herd or locality before calculating comparative prices between live weight and dressed weight bases. Packing companies and sales agencies would no doubt be glad to co-operate in providing such information.

Beef By-Products

When considering the sale of his cattle on the carcass basis, the producer is interested in the products other than beef the animal provides. While the dressed carcass makes up the greater part of the value of the animal, the offals and other by-products have considerable influence on the price paid. For instance, in a period when hides and tallow are high in price the processor may be able to pay the producer as much as or more than he gets for the carcass as beef, by-products providing for the packer's services. At other times the buyer may not be able to pay the farmer as much as he realizes for the beef. This is one of the reasons why the price of cattle may change when the price of beef does not change, or vice versa.

The following table shows the average weights per carcass for the various by-products obtained on some 3,500 cattle during the years 1945-6-7. The steers and heifers were about equally divided between the top three grades, *Choice*, *Good*, and *Commercial*.

Cattle Carcass Yields, Offals and Hides

——	Steers and Heifers	Cows Good to Medium	Cows Common and Canner	Bulls
Number of Cattle	2,590	787	118	76
Aver. Weight—Alive (pounds)	1,002	1,118	885	1,405
Aver. Weight—Dressed (pounds)	530	528	376	721
Yield—Defatted (per cent)	52.8	47.3	42.9	51.4
Average Weight of Offals (pounds):				
Hearts	3.5	3.4	3.3	4.3
Livers	9.1	10.3	7.7	10.8
Tails	1.3	1.4	1.1	1.7
Tripe	15.5	19.7	14.3	17.5
Kidneys	1.9	2.3	2.2	2.4
Killing Fat	23.8	29.3	9.5	22.6
Defatting Fat	19.1	19.7	6.4	15.5
Hides	60.2	55.2	47.2	89.5

Hides—average 7 per cent of live weight, may range from 6½ to 8 per cent.
Blood—25-40 lb. per animal (5 to 8 lb. dried).

PRESENT AND PROSPECTIVE STATUS OF BEEF GRADING

Grading and Branding for the Consumer

As indicated, practically all beef eligible for *Red* and *Blue* brands has been graded and branded since World War II. The third grade, *Commercial*, is being branded to a limited extent and this practice appears to be increasing. All qualities sold in the Vancouver area are graded and branded under provincial legislation while similar requirements affecting the St. John's area are shortly to be made effective by the province of Newfoundland.

For the most part, beef grading and branding is restricted to the cattle killed under federal inspection, and while this accounts for the great bulk of the beef, particularly of *Choice* and *Good* qualities, a small quantity of beef killed in small slaughter houses is not eligible for branding. In one or two cases an arrangement has been made between a provincial government and the Canada Department of Agriculture whereby the federal grading service is applied in case of certain beef killed under a system of provincial inspection having standards similar to those under federal inspection. This ensures that the national brand marks are not applied to meat not from healthy animals, and not handled under strictly sanitary conditions. The consumer, therefore, should always find associated with the national ribbon brands on beef an inspection stamp denoting the wholesomeness of the product.

While the federal government has no authority to require the grading of commodities unless they cross provincial boundaries, it seems possible that with increasing consumer dependence on official grading to indicate meat quality, compulsory beef branding may become effective in other large centers through provincial government action. With the two top grades already being branded on the voluntary basis, this has the effect of causing the remaining two grades, *Commercial* and *Utility*, to be marked also, the main distinction being between meat from lean, youthful animals and meat from old cows or bulls. The additional grading service, available on request, is readily provided since all the carcasses are being graded for a record of quality, whether or not they are stamped and branded.

Grading for Producer Settlement

As indicated, most of the cattle in the Maritime Provinces have been sold on the carcass basis in recent years and the system is being followed to an increasing degree in various parts of the country. Buyer and seller frequently make their own deal involving dressed grade and weight without the knowledge of the government grader. Official grade certificates are available on request provided the cattle are identified and the producer's name supplied.

Individual lots are often segregated and put through the kill without special identification but this plan falls short of providing the positive identification of the carcasses which the producer should demand for his own protection. Satisfactory identification of beef carcasses is achieved through the use of small metal numbered tags attached to the ears of the live animals with pig rings, and transferred to the carcasses during the skinning operations.

The growing demand from producers for greater accuracy in the accounting for the weight and quality of the commodities they market seems to indicate a steady trend toward sale of cattle and other meat animals on the carcass basis.

Quality Trends in Cattle and Beef

A definite record of the meat quality of Canadian cattle is available only for cattle slaughtered and carcass-graded in Canada. While this accounts for the great bulk of the marketings, 10 per cent or more of the production may be exported in the form of live cattle or ungraded beef and the quality of this export surplus can have an important influence on the quality of the supply for home consumption.

In recent years the cattle population has not kept pace with the increase in human population. While there has been improvement in the quality of beef cattle, the large requirements for dairy products results in a high proportion of dairy-type animals among the cattle slaughtered. These show up largely as cows and calves, or as *Commercial* and *Utility* steers and heifers.

The following table shows the carcass grading of cattle slaughtered under inspection for three representative years commencing with 1947 which was the first year information was obtained.

Beef Carcass Gradings by Percentages—Canada

	Grade	*1947*	*1950*	*1953*
A	Choice	12.3	6.0	17.6
B	Good	19.0	10.7	18.1
C	Commercial	25.5	24.4	24.1
D1	Utility steer and heifer	6.4	7.7	8.0
D2	Utility—good cow	14.2	13.9	10.3
D3	Utility—medium cow	7.3	11.7	6.5
M	Manufacturing	15.0	18.5	10.1
S	Stag and bull		6.8	5.3
	Total Cattle	1,304,117	1,284,684	1,469,329

In 1952 and 1953 the gradings showed considerable improvement in quality partly because of improvement in the cattle produced, but mainly the result of greatly reduced numbers shipped to the United States, thus leaving more high-quality cattle for slaughter at home. There is considerable variation in the quality of the cattle killed in the different areas of the country. British Columbia with its compulsory grading attracts the best cattle, with Alberta next, and Ontario third. Following are the 1953 percentages of the two top grades by province where graded:

	A	B
B.C.	41.6	20.5
Alta.	24.8	20.5
Sask.	8.6	17.5
Man.	9.0	15.8
Ont.	20.6	22.4
Que.	9.2	9.4
Maritimes	1.0	6.0

These figures do not accurately represent the quality of beef consumed in the eastern areas since large quantities of the product are regularly moved from west to east. *Choice* and *Good* beef, as required, is available to the consumer in all provinces.

VEAL GRADING

Historical

Standards for official veal carcass grades were established in October, 1950, following lengthy consideration. It was recognized that there was no clear cut type and weight of calf which could be closely defined as the ideal for a national standard. The heavy weight beef type of calf which tops the market in the West is far different from the light dairy calf which is quite acceptable in the East. It was also noted that the United States distinguished between the heavier calves and veal, and had set up official standards for both. There was concern about the extreme differences between milk-fed and grass-fed calves.

However, since certain selling agencies were pressing for official grades for veal, and were in fact already selling calves on carcass weight and grade which the staff was grading unofficially, it was agreed that official standards were required. The specifications were made fairly broad with the idea that exact standards would be gradually developed to fit the various kinds of calves marketed, and this plan has proved satisfactory in the Maritime Provinces and Quebec where veal grading is in effect.

Practical Grading

Since the hide is usually left on veal carcasses until just before delivery from the plant in order to reduce evaporation and improve the appearance, the grading may be done either with hide on or hide off, and the carcasses are usually unsplit. Thus the grading of veal differs considerably from that for other meat carcasses.

The main factors to be relied on are depth of fleshing, interior finish, and color of fat and lean. The color of the lean is considered an important indication of quality, and thickness of fleshing in the flank, over the shoulder and loin and on the forearm are emphasized. Considerable handling of the carcasses is done in grading hide-on veal.

No provision has been made for the branding of veal, but the problem is being studied. The moist surface of the freshly skinned carcass presents a peculiar difficulty in branding.

Weights of Veal

The weight is not a factor in grading. Sometimes calves dressing 300 lb. or over are dressed as veal, due to price considerations. The grader is not concerned as to whether he is grading beef or veal—he designates it in accordance with the way it is dressed.

Veal carcasses are classified by the trade somewhat as follows, preference being for the lighter weights:

Skin off	*Skin on*
up to 175	up to 185
176-200	186-215
201 and up	216 and up

Grass Calves

These calves weigh from around 150 to 400 lb. alive, and four to eight months of age and come to market in the fall from dairy districts. They are usually thin and the quality is poor. Most of them are boners and belong in the grade M. Under better production methods, these surplus dairy calves are finished off as veal at an earlier age and with better fleshing.

Left to right: Grades 'A' and 'B' veal carcasses; cross-sections below.

Left to right: Grades 'C' and 'D' veal carcasses; cross-sections below.

LAMB AND MUTTON GRADING IN CANADA

Historical

The first official carcass grading of lambs for sale on a carcass weight and carcass grade basis in Canada took place in a Nova Scotia packing plant on July 19, 1939. The lambs were consigned by a farmer's co-operative organization in the Maritime Provinces.

This important step followed representations by the Canadian Sheep Breeders Association in 1927 and again in 1937. A member of the Livestock Products Grading Staff was detailed to specialize in the project and considerable experimental work was carried on at Toronto and other points, but lamb grading really developed in the Maritimes where departmental representatives worked several seasons in co-operation with local officials and trade.

In 1945, official grading of lamb carcasses began in Ontario at the request of a Manitoulin co-operative where systematic work in lamb improvement had been under way for years by the Canada Department of Agriculture. Other areas in northern Ontario followed with requests for the carcass grading service.

Changes in grade specifications, weight requirements, method of lamb identifications, form of grading certificates, method of weighing, and basis of arriving at prices, occurred from time to time in the light of information obtained through experiments and trade practice. In 1946, the first tentative schedule of mutton grades was drafted. Revised lamb and mutton carcass grades were made effective at the beginning of 1948.

CARCASS IDENTIFICATION

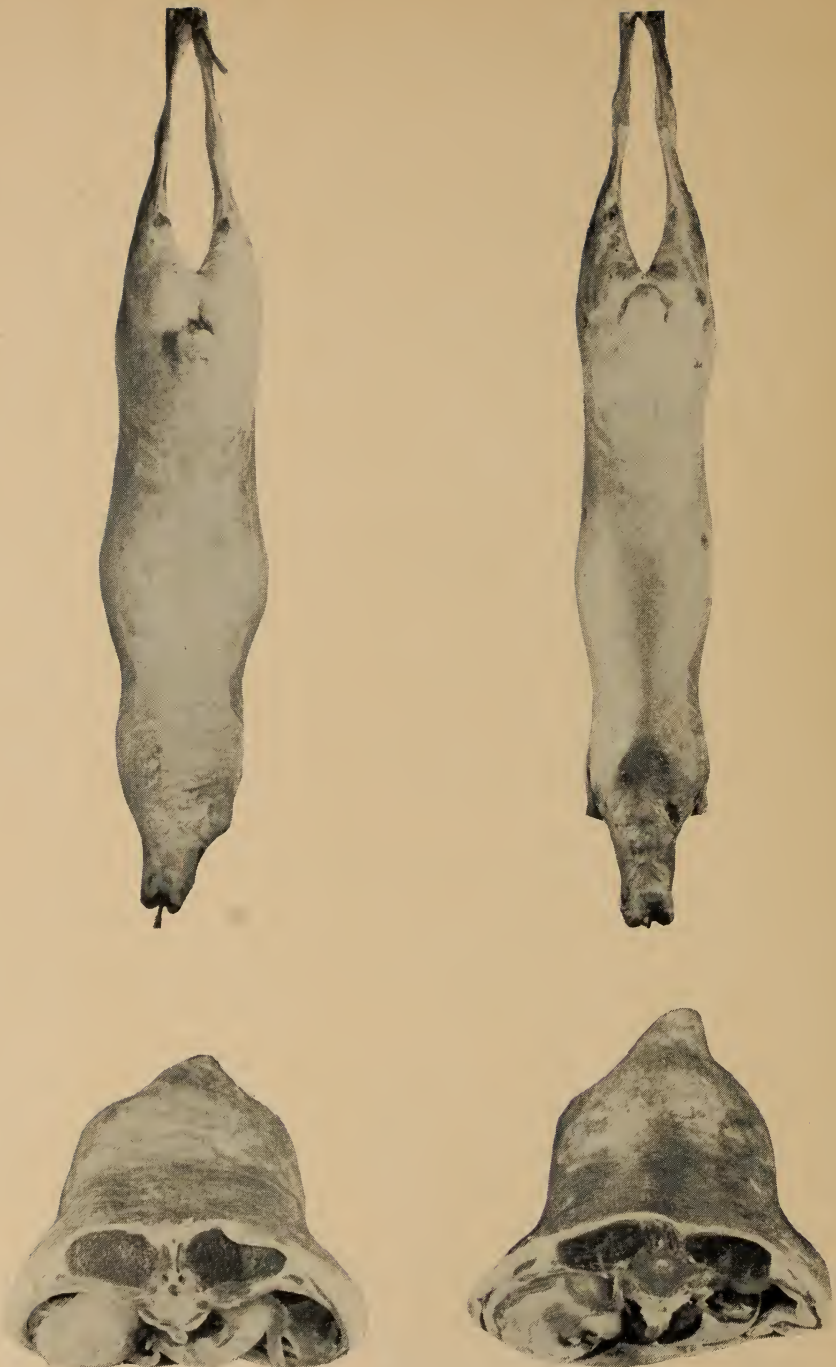
After considerable experimental work with various methods of identification, a system was developed of fastening a numbered waterproof tag in each lamb's ear with a pig ring. The tag numbers are recorded on manifest forms by the shipper when doing the tagging, along with the farmer's name, address and number of lambs in the lot.

The tags are doubled over, numbers to the outside, placed flat and clamped inside the ear close to the head. If they are loosely attached, they will hang down and may be nibbled off by other lambs. This operation requires considerable care and skill, and it is most important that operators should be fully instructed. The tags are transferred from the ear to the leg of the carcass after slaughter.

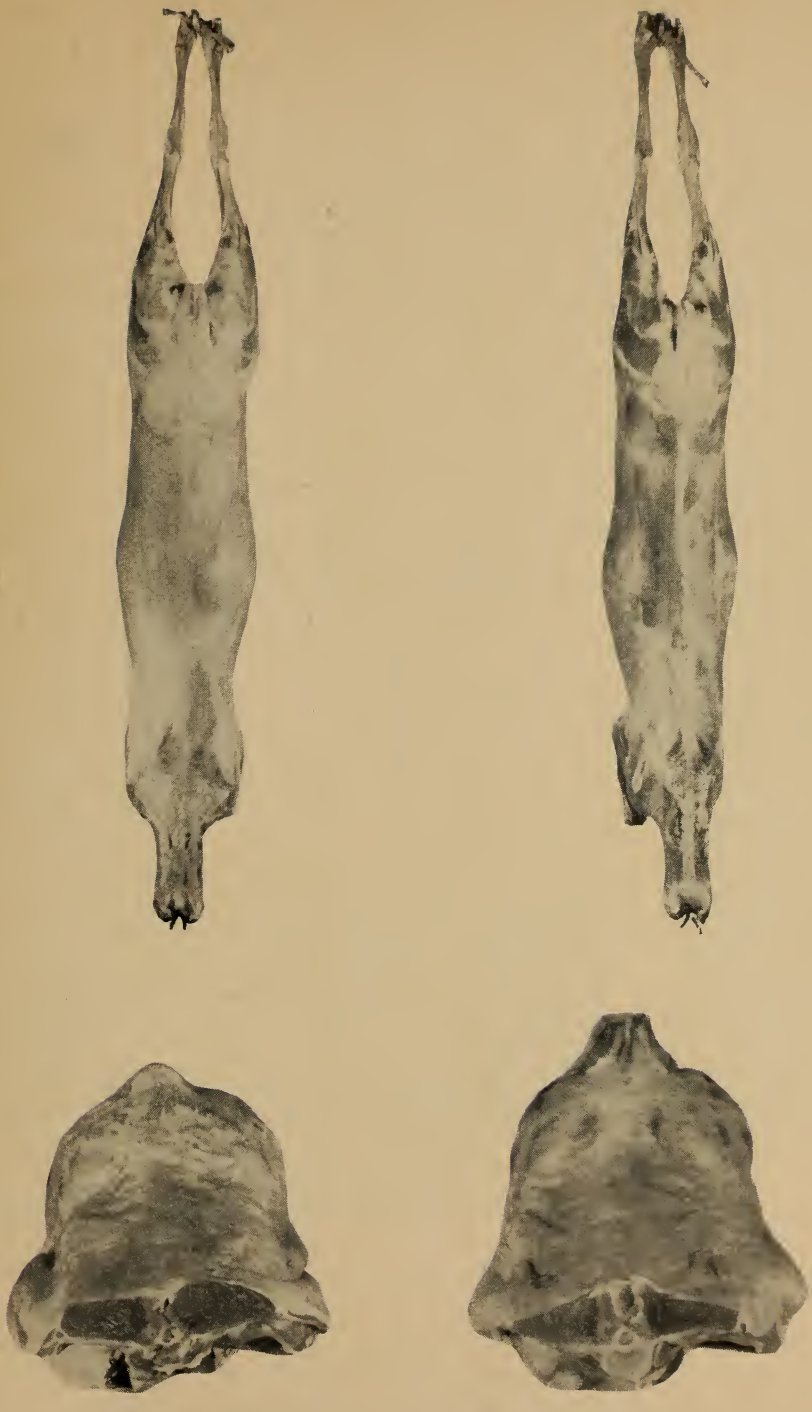
DETERMINATION OF AGE AND CLASS

Canadian Classification

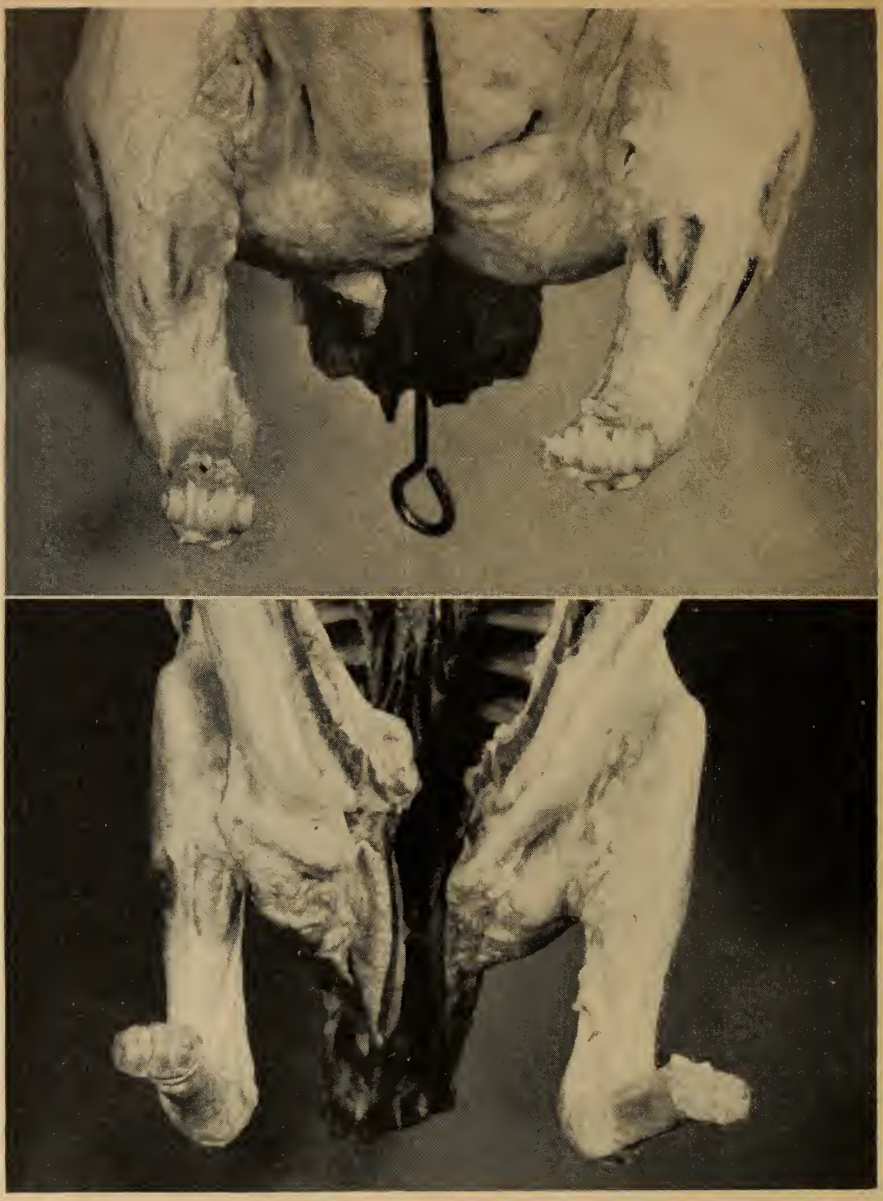
The Canadian system recognizes two classifications—lamb and mutton—contrasted with other systems where grades may be defined for lamb, yearling mutton, and mutton. In Canada, yearling carcasses displaying break joints are regarded as lamb and those with spool joints as mutton.



Left to right: Grades 'A' and 'B' lamb carcasses; cross-sections below.



Left to right: Grades 'C' and 'D' lamb carcasses; cross-sections below.



Determination of age. *Upper:* Mature sheep show smooth spool-like joint. *Lower:* Lambs up to 14 months old have rough break joint.

Lamb

"Lamb" is a general term which refers to the flesh of young animals of both sexes of the ovine species.

Lamb carcasses as a group are distinguished from mutton carcasses by smaller and softer bones, light-colored flesh, softer and whiter external and internal fats, smaller carcasses and cuts, and by the break joint of the forelegs from which the flesh recedes exposing up to three quarters of an inch of bone. Of these characteristics, the break joint is probably the most important.

Caul dressed lamb.

The age at which the break joint ossifies and the foot is cut off at the spool joint ranges from 14 to 20 months at which time the carcass is graded as mutton. Lamb foreleg joints break in four well-defined ridges, resembling the teeth of a saw. The ridges are smooth, moist, and red with blood. The bones of the hind legs are also streaked with blood at this period. As lambs approach the yearling stage, the bones become harder and whiter and the break joints, although retaining the saw-tooth effect, are relatively harder and more porous and there is only a slight indication of blood at the joint. Bones in lamb carcasses are easily cut or sawed. In the better grades the flesh is fine-grained, smooth, velvety, and light pink in color.

The outer covering of fat is smooth, evenly distributed, with a creamy or pinkish color. Interior fats are of like quality and vary in quantity and evenness of distribution according to the grade. All fats lack brittleness and possess in a greater or less degree the softness and sheen characteristic of milk fat. This feature, produced by a milk diet, is especially pronounced in carcasses of hot-house lambs and to a lesser extent in regular spring lambs marketed at or before weaning time and without access to feeds other than milk.

Spring Lamb

The term "spring lamb" refers to meat from young lambs of weaning age or younger, usually sold for slaughter at ages ranging from three to five months. The flesh is uniformly tender and a shade lighter than that of more mature lambs. On account of the character of the feed (almost exclusively milk) such carcasses

are often referred to as "milk lambs". Most spring-lamb carcasses weigh between 30 and 35 pounds with a limited number weighing down to 20 pounds or below, some up to 40 pounds.

Mutton

Mutton carcasses are from animals of the ovine species which have passed the lamb stage. Breed, sex, feed and handling are responsible for variations in the age limits at which maturity is reached. These variations involve months only and at most will not exceed six months. It is therefore generally understood that lambs cease to be lambs at from 14 to 20 months of age.

Outstanding features peculiar to each group are largely the result of age and are really the basis of the classes—lambs and mutton. These features are fixed and do not vary greatly in different carcasses of the same class. There are also some variations in maturity between wethers and ewes. Males are somewhat slower to mature than females as evidenced by the relative hardness of the bones in animals of the two sexes of the same age. Allowance in these respects should therefore be made for conditions imposed by nature. In the process of breeding and giving birth the conformation of the ewe is changed to some extent. These changes do not appear in lamb carcasses and only on rare occasions in yearling mutton carcasses.

In mature mutton, the ribs show a much more pronounced spring or bow than is usual in lamb carcasses. This gives the sides a distended, barrel-like, appearance, particularly in ewes, whereas those of lamb are relatively straight and more compact, and the general outline is more uniform and even.

A feature peculiar to mature mutton carcasses is the appearance of the ankle joint of the forelegs. In mature mutton forelegs the saw-tooth effect is absent, When a lamb has passed through the yearling stage and become a sheep, the cartilage is ossified or hardened and the bone no longer breakable at the break joint and the foot is separated from the foreleg at the ankle joint. Thereafter the knuckle normally forms the extreme end of the foreleg and presents a hard smooth, white, shiny surface with two prominent ridges, commonly called the "spool joint".

Another distinguishing feature is the color of the flesh. Mutton ranges from light to dark red, compared with medium pink to light red in yearling mutton and light to dark pink in lamb. This also applies to the thin strips of lean meat extending over the exterior of the back and sides and somewhat broader covering of lean over the breast. The quantity of lean and its even distribution over the carcass varies according to the grade of the carcass, but it is always visible to a greater or less extent under the fell, a thin, tough membrane covering the carcass immediately under the pelt. It should be removed before cooking.

Bucks and Rams

Carcasses of male lambs and sheep which have not been castrated are graded as bucks and rams. No carcass is graded as a buck unless the testes are present, or a veterinary inspector so designates and marks it.

DETERMINATION OF SEX

There are a number of ways to determine the sex of lambs and sheep.

(1) Presence of testes attached to carcass.

(2) General conformation of carcass. Males have a shorter thicker neck, heavier shoulder and breast, relatively smaller hindquarters in proportion to forequarters, larger bones, coarser, darker colored flesh. These characteristics are obscure in lambs but distinct in older males.

(3) Ewes have relatively larger abdominal cavities, larger pelvic openings and pelvic arches and smaller necks and shanks.

(4) Wethers have lobulated cod fat. Ewe lambs have smooth, fat udders. With ewes in milk the udder tissue is brownish and spongy and, even though mostly cut off, some trace may often be seen.

(5) In the pelvic opening of males, a distinct dark reddish "plum" or muscle is visible if the tail is not skewered tight to the body. This "plum" is inside the bung opening on the lower side opposite the backbone.

Difficulty is sometimes experienced in distinguishing between a buck and wether lamb. It is customary to have the testicles left attached to carcasses from bucks until after grading. An imperfect job often results if lambs are castrated with pincers the testes being present but of less than normal size. A slight incision will reveal whether the tissue is living or dead. As a rule, the penis of a wether is about the diameter of a lead pencil, while in the buck it is twice this size.

CONFORMATION AND FINISH

While sufficient fat covering is desired, it is possible to overdo it. A smooth, even covering over the exterior of the carcass, as well as a generous but not excessive amount over the kidneys on the interior is desirable.

The tips of the shoulder blades are usually the last places to cover on the exterior of a lamb. When they are noticeably overspread with a layer of fat but still allowing the tips of the blades to show through as a somewhat darkened area, and coincidentally a pair of "eyes", each about the side of a quarter appearing at the back of the loin between the hip bones, and all other parts well covered with fat, the degree of finish is likely to be just about ideal. If one or both of these darkened areas do not appear the carcass is likely to be over-finished.

The chief significance of "finish" lies in the fact that a certain quantity of intermuscular and intercellular fat is essential to quality and palatability, besides being of advantage to "carry" that cut in the pan when cooking. A small extra quantity of fat, however, quickly constitutes excess. This is reflected in a price-cut in the trade in proportion to the degree of excess fat. It must be pointed out that few lambs are over-finished to the point of being degraded as may happen with mutton.

In brief, finish which one cannot see through, except at the shoulder tip and loin or in either area is "A" grade finish. When these areas are dark and a darkness also appears at a spot in the middle of the loin on each side of the backbone, an inch or two in diameter, this is a "B" grade finish. When these spots are elongated and appear in any way as a dark streak down each side of the backbone, it is "C" grade finish. When it can be seen through almost any place, it is "D" grade finish, and where it is lacking, this is "E" grade finish.

The conformation required for a grade "A" lamb is defined as, "Excellent conformation, relatively short and compact, with short plump legs, broad thick back, thick full loin, rib and chuck and short plump neck."

While shortness and compactness are characteristics of a good lamb carcass, length of side is itself an asset. Other things being equal, the longer lamb is the better one since it will provide a longer loin which means more chops. The shoulder point, an important area, should be well fleshed.

GRADING PROCEDURES

Special precautions are necessary in handling lambs designated for carcass grading, especially in packing plants where this is not common practice.

The shipper or sales agency will have advised the packing firm that a certain shipment is for rail grading and the lambs identified according to farmer ownership and a manifest provided to record the information. The packer notifies the government grader when such lambs are to be killed and it is the joint responsibility of the packer and the grader to see that all necessary preparations are made on the killing floor.

This involves arrangement for the appropriate plant employees to remove the identification tag from the lamb's ear and fasten it to the carcass with a wire brad. The best location on the carcass must be determined in the light of plant pelting practice to avoid injury to the workman's hands from the brads. Attention may be needed to see the tags come through the washing process intact. Scales must be accessible and accurate, and weight tickets at hand.

The carcasses are weighed warm. In the case of caul-dressed lambs no tare is allowed for the sticks and caul, as these are regarded in the trade as part of the carcass. Standard dressing practice is followed: at time of weighing, the pelt, head and feet have been removed but kidneys and kidney fat are left in.

Warm Versus Cold Carcass Grading

Lamb and mutton carcasses may be graded hot or cold. It is probably easier to make an accurate appraisal of the carcasses after cooling but it is possible to do it satisfactorily when they are still warm and this is usually done where lambs are being carcass-graded in volume to facilitate speedy settlement to the producer. Under this system the graders make frequent checks in the cooler the day following slaughter to compare the cold carcasses with the grading awarded the previous day. The tendency is for warm, wet carcasses to appear to have more fat covering than they really possess. After chilling and drying the lean meat will show through a light finish more clearly.

Grading Certificates

The procedure in issuing grading certificates is much the same as for hogs. The weight tickets (which show weight, grade and identification) are taken to the office and sorted according to farmer ownership, after which each certificate is made up. Combination forms are used by the larger operators: one form serves as both official certificate of grading and statement of settlement. The government grader will complete, or check, and sign the part showing the grade while the sales agency or packer will calculate the settlement. In many cases individual carcass weights are shown for the producer's information.

Some Special Factors in Grading

Care is taken to distinguish between light ewes and lambs. The break joint and other indications of youth are required in the lamb carcass.

Lambs are graded as bucks only if the testicles are present and noted by the grader or the veterinary inspector.

Long tails are not a factor in carcass grading. Any loss due to long tails will be reflected in the carcass weight and grade.

Spear Grass Infestation

This is found in lambs from sections of western Canada where spear grass is prevalent and may be found in feed-lot lambs originating in these areas.

The seed resembles a gramophone needle or small wild oat seed. Hard and sharp, it works into the underside of the lamb as a porcupine quill would. Some seeds are visible, others often hidden in the flesh. Damage from this cause renders the infested portions of meat unfit for food. These must be trimmed off and discarded thus lowering the commercial value of the carcass.

DRESSING PERCENTAGES

The general principle of dealing in lambs on a basis of carcass weight and grade is that an average lot will bring the same total return whether sold on the live weight or dressed weight and grade. A better-than-average lot of lambs in carcass yield or quality would bring the producer more on the rail than on live basis and a poorer-than-average lot would bring less on the rail or dressed basis.

Causes of Variation in Dressing Percentage

(1) Weight of Lambs—Heavier lambs yield a higher percentage of meat than lighter lambs.

(2) Degree of Finish—Fatter lambs have a higher dressing percentage than thin lambs.

(3) Grade of Lambs—Grade "A" lambs due to conformation and finish, as a rule, have a higher dressing percentage than "B" grade lambs; "B" than "C" and so on.

(4) Amount of Fill—Lambs recently fed and watered yield less than those starved for 24 hours or longer.

(5) Wet or Dry—Lambs with wet wool weigh heavier alive than normally, consequently have a low dressing percentage.

(6) Weight of Pelt—Density and amount of fleece have some effect on dressing percentages.

Influence of Grade on Yield

Surveys made on a large volume of lambs reveal a correlation between lamb quality and dressing percentages. Better quality lambs yield considerably higher than poorer quality. This is illustrated in the following tables:

(1)—A shipment of outstanding lambs weighed F.O.B.

	Total	A1	A2	A3	A4	B1	B2	C1
No. each Grade	658	327	162	68	37	53	4	7
Per cent each Grade	100	49.6	24.6	10.3	5.6	8.1	.7	1.1
Per cent Yield	50.8	50.2	51.0	52.75	55.1	47.3	48.9	46.7

(2)—**A shipment of slightly below average quality lambs**

	Total	*A1*	*A2*	*A3*	*A4*	*B1*	*B2*	*B3*	*C1*	*D1*	*E*
Grade	1,000	263	147	74	62	282	20	4	98	36	14
Per cent each Grade.	100	26.3	14.7	7.4	6.2	28.2	2.0	.4	9.8	3.6	1.4
Per cent Yield	46.2	46.2	48.0	49.4	50.6	44.5	45.8	46.2	43.1	41.7	39.6

(In arriving at yields on the above shipments, live weights were taken on an F.O.B. basis)

A Comparison in Yield of Lambs Weighed F.O.B. Country Points and W.O.C. Plants

It is generally recognized the yield in lambs weighed off car at plants is higher than the yield in lambs weighed F.O.B. country points.

A survey on 2,361 lambs shipped W.O.C.over a 12-week period revealed:

(1)	Total number of lambs	2,361
(2)	Total live weight	201,476 lb.
(3)	Total dressed weight	102,113 lb.
(4)	Average live weight	85.3 lb.
(5)	Average dressed weight	43.2 lb.
(6)	Dressing percentage	50.6

A survey on a shipment of 1,000 lambs weighed F.O.B. showed:

(1)	Total number of lambs	1,000
(2)	Total live weight	91,319 lb.
(3)	Total dressed weight	42,231 lb.
(4)	Average live weight	91.3 lb.
(5)	Average dressed weight	42.2 lb.
(6)	Dressing percentage	46.2

PAYMENT ACCORDING TO CARCASS WEIGHT AND GRADE

Calculation of Prices and Differentials

A basic principle of merchandising lambs on a carcass basis is the use of differentials in value for various grades.

In buying and selling lambs on a carcass basis, the A1 price may be the basic price with deductions for the other grades according to market value. These deductions may vary according to time and place depending on supply and demand for the various qualities. Buyers and sellers may agree to sell each grade on its own merits as trading conditions warrant and therefore have no fixed differentials between grades.

Specimen Method of Calculating Price for Dressed Lambs from Current Live Prices

In calculating Basic or A1 price under this plan, 50 cents per head or $1.25 per cwt. is added to the average live price, therefore A1, A2 and B1 grades all rate premiums in spite of discounts indicated:

$$\text{W.O.C. } \frac{100}{49} \times \text{live price} + \$1.25 = \text{Price warm dressed weight.}$$

$$\text{F.O.B. } \frac{100}{43} \times \text{live price} + \$1.25 = \text{Price warm dressed weight.}$$

This is a rule-of-thumb which has been used to some extent in calculating carcass price, but in trade practice the lamb buyers soon find what dressed price will buy lambs at the same overall cost as the live price.

EDMOND CLOUTIER, C.M.G., O.A., D.S.P.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1955